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THE MEDICAL JOURNAL OF AUSTRALIA.

VOL. II.—3RD YEAR. SYDNEY: NOVEMBER 11, 1916. No. 20.

THE ADMINISTRATIVE CONTROL OF PULMONARY TUBERCULOSIS IN AUSTRALIA.

By J. King Patrick, M.D., Ch.B., B.Sc., D.P.H.,
Brisbane.

(*Continued from page* 382.)

(*c*) Food Inspection.—The part played by foodstuffs in the propagation of tuberculosis is a problem of surpassing magnitude and importance. The relation of tuberculosis of domestic animals to that of man, in spite of Koch's startling statement in 1901 that the bacilli of human tuberculosis and those causing the disease in animals are separate and distinct, and that, in consequence, the two forms of tuberculosis are not intercommunicable, has been definitely proved on the evidence of the Royal Commission on Tuberculosis, whose findings were published in 1911. It is now accepted, on the evidence of the Commission, that the bovine bacillus is capable of causing tuberculosis in man, and must be regarded as one of the main sources of infection in children, through the medium of infected milk. If we accept this statement, it follows that the necessity for thorough supervision of our milk and meat supply is a clamant one, in view of the danger of infection through these channels. It is obviously bad business to spend large sums of money in equipping and maintaining sanatoria, dispensaries, and other curative institutions, if we neglect to control the influx of tubercle-infected milk and meat into our centres of population.

Milk and Milk Products.—The tubercle bacillus enters the human body by two main portals, *viz.*, (1) the respiratory tract, and (2) the digestive tract. In the adult, the most common method of infection is probably by the first means, and the source of infection is to be found in the active tubercle bacilli liberated from desiccated sputum and other discharges. In the latter, the most common method of infection is probably by means of cow's milk and milk products, and mainly affects the child, giving rise to non-pulmonary forms of tuberculosis. These facts may be taken to explain the greater preponderance of pulmonary tuberculosis among adults and of non-pulmonary tuberculosis among children. Broadly speaking, the more common source of infection in adult life is the human variety of the tubercle bacillus, whilst in children the bovine variety accounts for the majority of the cases found. Von Behring has stated that pulmonary infection in later life is generally the result of intestinal infection during infancy. The Final Report of the Royal Commission on Tuberculosis contains details of an investigation, which indicates that in 22% of persons dying before the age of 15 from tuberculosis of various organs, there was evidence of infection by tuberculous products of bovine origin, and that in most of these cases the channel of infection was the alimentary canal. Professor Delépine[4] has investigated the result of the strict administrative control which has been exercised over the milk supply of Manchester in relation to its effect on the mortality from non-pulmonary tuberculosis among children. Before 1900, when comparatively few samples of milk were examined, the percentage of samples found to contain tubercle bacilli was 17.2. In 1910, 528 samples were examined, and rather less than 6% were found to contain the organism. Concurrently with the strict control of the milk supply, the mortality from non-pulmonary tuberculosis among children under five years of age fell, and the fall was found to be proportionately very much greater than the general fall in the death-rate from pulmonary tuberculosis which occurred during the same period. On examining the death-rates from pulmonary and from non-pulmonary forms of tuberculosis living at the age groups 0-5 years and 35-45 years respectively, it is found that the ratio in the first group is as 100 is to 850, while in the second age group the ratio is as 100 is to 6. Assuming that this difference can be accounted for by the respective channels of infection, it would appear that bovine tuberculosis is responsible for the greater preponderance of non-pulmonary tuberculosis before the age of five, and Delépine's figures would indicate that the tuberculosis death-rate at this age is capable of being distinctly influenced by measures directed to the control of the supply of tubercle-infected milk. The evidence quoted shows that, in the opinion of the highest authorities, cow's milk is largely responsible for the tuberculosis of early life. The question naturally arises: How is this state of affairs to be combated? Preventive measures in this direction must include the following, *viz.*:—

(1) Inspection of dairy premises and cow sheds.
(2) Examination of cows by the tuberculin test.
(3) Separation of the tuberculous cattle from the non-tuberculous, and the slaughter of milk-producing tuberculous cows.

Tuberculosis is a disease of the domesticated animal, and, as in the human subject, it is largely a result of the artificial environment of the animal. Cow sheds must be strictly regulated as regards cleanliness and ventilation; this can only be done by regular inspection and the education of the farmer as to the benefit of keeping his cattle as much out-of-doors as the weather will allow, and, when indoors, housing them in clean, freely-ventilated sheds. The milk obtained from ungroomed cows living in filthy, stuffy cowsheds, and obtained by the agency of a person of doubtful cleanliness, who carefully, as a preliminary to the milking process, wets his grimy hands with milk drawn from the cow, or even with his own saliva, is not calculated to be a germ-free product. When, in addition, the cow's udder is affected with tuberculosis or the milker is a consumptive, the part played in the dissemination of tuberculosis by that particular sample of milk

would not, in all likelihood, be, by any means, a negligible quantity.

The Public Health Department should administer the following measures bearing upon the control of the milk industry, *viz.*, registration of dairies and dairymen; the inspection of dairies; the examination of cows for tubercular disease; the prevention of the sale of tuberculous milk; the issue of regulations for securing the supply of pure and wholesome milk and the establishment in populous places of milk depôts for the sale of milk specially prepared for infants. Such measures are of the very greatest importance from the point of view of the anti-tuberculosis campaign, and should apply to every part of the State. So long as tubercle-infected milk finds its way into our centres of population the tuberculosis problem can never be solved. The establishment of milk depôts for the medical supervision of infants, for the education of mothers in the principles of hygiene as applied to the rearing of infants and for the supply of pure milk for those infants who must be hand-fed, is an important factor in preventive machinery carried out with conspicuous success in many centres in Great Britain. In this way the child may be kept under observation until it reaches school age, after which he comes under the supervision of the education authority.

The part played by tuberculous meat in the dissemination of tuberculosis is usually curtly dismissed with the observation that, even if the danger of infection be admitted, the meat is cooked, and, consequently, the danger is obviated, and also that an efficient system of meat inspection is in vogue. It has been shown that the temperature reached in the interior of a moderate-sized joint in the process of cooking is not sufficiently high to destroy the bacillus, and so long as underdone meat is partaken of, this danger is by no means so trivial as it appears. Even if the direct infection of tuberculosis by tuberculous meat were disproved, which it is not, there does not appear to be any reason why the consumer should be asked to eat diseased meat and so convert his digestive tract into a receptacle for pathological products. Meat inspection on present lines cannot be regarded as thorough, and is lacking in uniformity. What is wanted is a definite legal standard and the abolition of the private slaughter-house and the inauguration of Government-controlled abattoirs. Meat inspection throughout the country must be compulsory, and it must be uniform. Every ounce of meat sold in this country should be inspected and certified free from disease. In this way the attention of breeders would be directed to the problem of the eradication of tuberculosis from cattle and other animals used for food, a problem by no means impossible of solution, and it would have the double effect of eliminating tubercle from both the milk and meat supply of the country. If this ideal were aimed at and achieved, the amount paid in compensation would, in years to come, become very trivial. It seems fairly obvious that the chief difficulty which arises in efforts to control the milk supply, to eliminate tuberculosis from animals used for human food, and to segregate advanced cases of pulmonary tuberculosis in the human subject, all of which must be deemed to contribute to an enormous extent to the inception and spread of the disease, is the matter of finance. The schemes which I have advocated are admittedly expensive ones; but surely the national money could not be invested in a better way. What better investment can any country desire than one which pays a dividend in the shape of the diminution and ultimately the entire eradication of the tuberculous death-rate, a dividend of human life and health and happiness. It would certainly be wiser to spend our money on prevention rather than on palliation. The natural result of spending money freely and wisely on prevention must obviously be that treatment and palliation will cost us less, and, incidentally, there is the unspeakable gain of spared and useful lives; able-bodied men instead of bed-ridden invalids and cripples, and the abolition of the want and destitution which always accompany sickness among the poorer classes.

(*d*) Disinfection of Infected Houses.—The consumptive who moves from house to house infects successive dwellings, and it is important that the Public Health Department should keep in close touch with such persons, so that, at the end of each term of occupancy, or in the event of his death, the house should be thoroughly cleansed and disinfected.

The Rôle of the Central Tuberculosis Bureau.

I have placed the Central Tuberculosis Bureau in the centre of the diagram, to indicate that it should be the central point of all anti-tuberculosis effort. "It should constitute at once the information-bureau, the 'clearing-house' in respect of all sorts of tuberculous material, and the centre of supervision and treatment of such patients as may safely be treated at their own homes."—Philip.[5] It should be linked up with the Public Health Department, the sanatorium, the hospital for advanced cases, the labour colony, the school medical inspection department, voluntary agencies and the general practitioner, and its function must be educative and supervisory, as well as curative.

Of particular importance is the work of the examination of "contacts," that is, the persons living in the same house as a consumptive patient, and therefore particularly exposed to the infection of the disease. If, as too frequently happens, the patient suffering from pulmonary tuberculosis does not come under medical supervision until the disease has definitely declared itself, that is, until the symptoms and physical signs on examination are clearly those of phthisis, it is obvious that the disease has now obtained a firm hold of the individual who has possibly been actively infective for some time prior to seeking advice. Both from the point of view of the patient and of the community it is important that pulmonary tuberculosis should be diagnosed at the earliest possible moment, and by examining "contacts" of established cases many early and hitherto unsuspected cases of the disease would be brought to light. The importance of this work, both from the point of view of prevention and of treatment, can scarcely be exaggerated.

The functions discharged of such a Central Tuberculosis Bureau may be summarized as follows:—

(1) The examination of patients referred to it from various sources, and those sent by medical practitioners for confirmation of diagnosis, etc. Information with regard to the distribution of pulmonary tuberculosis is gained from the notifications sent by medical practitioners to the Commissioner of Public Health, a statutory obligation placed upon them by the various Health Acts in Australia. Daily returns of such notifications would be transmitted to the Central Bureau, and the work of dealing with such cases, both from the point of view of prophylaxis and treatment, would then devolve on the medical officer and nurses attached to the Bureau, who would, of course, be responsible to the Commissioner of Public Health, and who would, at stated intervals, say weekly, or as required by the Commissioner, furnish a complete and detailed report as to the measures taken to deal with the cases.

(2) The selection of cases for sanatorium treatment, for reference to hospitals for advanced cases, labour colonies, etc. Every case of pulmonary tuberculosis in a given area would pass through the portals of the Central Tuberculosis Bureau for that area, and would be recommended for the treatment appropriate to the circumstances of the particular case. Some cases would be found to be in a sufficiently early stage to permit of treatment at the hands of the Medical Officer at the Bureau, combined with the strictest supervision of the home conditions by himself and the nurses on his staff. Others would be recommended for treatment at a sanatorium or at a hospital for advanced cases. In the case of a patient applying for sanatorium treatment on the recommendation of his medical attendant, a form of application would be submitted to the Medical Officer in charge of the Bureau, and the patient would be thoroughly examined by him, and on such Medical Officer would devolve the final duty and responsibility of selection. It is obvious that, under present conditions, unsuitable cases are sent to sanatoria, in some instances in such an advanced stage of the disease as to render sanatorium treatment unsuitable, and in others where no tuberculosis is found to exist on more careful examination being made. Without desiring in any way to cast reflections on the powers of diagnosis and ability to estimate the correct stage of the disease possessed by the medical practitioner, it is perfectly obvious that the average medical man engaged in general practice cannot be expected to possess the special knowledge required for dealing with the subject, and a great amount of expense would be spared and inconvenience to patients obviated if such recommendations were scrutinized by an expert at a Central Bureau.

The actual experience of sanatorium medical officers bears out this contention. Persons suffering from phthisis are sent to a sanatorium who, on account of the advanced stage of the disease, are unsuitable for treatment there and who occupy beds and incur expense which might be expended with the greatest benefit on behalf of early curable cases. On the other hand, patients are sent who cannot be regarded after careful examination to be suffering from tuberculosis and who simply constitute a waste of time and money as far as the sanatorium is concerned.

It is obvious then that to ensure the maximum of efficiency and the minimum of useless expense the closest co-operation should exist between the Central Bureau or Clearing House and the sanatorium, and to attain this ideal of efficiency it is a *sine qua non* that the administration of both items in the scheme should be under the same head. The key-note of success in anti-tuberculosis efforts is co-ordination of effort. Unco-ordinated effort means dissipation of energy, and, as Sir Robert Philip puts it, "The key to complete success in the campaign against consumption lies in the harmonious co-ordination of well-directed measures."[6]

(3) Treatment of persons suffering from pulmonary tuberculosis. As already indicated, certain cases will be met with where domiciliary treatment may be carried out, combined with supervision of all the factors likely to react unfavourably on the patient and those associated with him. Careful records of such cases would be kept and filed at the Central Bureau, containing full information as to the cause of the patient's illness, home conditions, occupational conditions, number of "contacts," number of those found affected with the disease, etc. The Tuberculosis Central Bureau is, in point of fact, the institution variously styled anti-tuberculosis dispensary, tuberculin dispensary, dispensary for the prevention and control of consumption, etc., in this and other countries. The term "dispensary," however, implies treatment, and unduly accentuates what is in reality only one of its functions. The functions and activities of a Central Tuberculosis Bureau are manifold and complex, and are by no means adequately described by the term dispensary. The Central Bureau must be the central agency from which all the other items in the anti-tuberculosis scheme are controlled and co-ordinated, dominated by the Public Health Department. As an isolated agency it is of little use, but as the central pivot of a well-organized and properly-co-ordinated scheme it must be of the greatest value. The same may be said of the sanatorium or any other item in the scheme. When each agency is linked up together in a co-ordinated scheme, embracing the sanitarian, the clinician, and the education authority, with the Central Bureau as the central binding influence and the Public Health Department as the dominating agency, the value of the scheme is at its highest and the maximum of efficiency in the work of both prophylaxis and treatment of the disease is to be looked for.

(4) Visitation of patients at their own homes for the purposes of (*a*) supervision and education, and (*b*) treatment by the medical officer and trained nurses. The work of treatment will obviously be undertaken by the medical officer alone or by a medical practitioner under his supervision. The efforts of the nurses, under the direction of the medical officer, will be directed to the removal of all unhygienic influences in the home, and the instruction of the patient and his friends in the best means to

be taken to combat the disease and to prevent the spread of infection.

(5) The examination of "contacts" of the patient. One of the most tragic features of pulmonary tuberculosis is that infected persons do not, as a rule, seek medical advice until the disease is well established, and, in consequence, difficult to cure. By carefully examining all cases in close relationship with existing cases of the disease, it is possible frequently to detect early and hitherto unsuspected cases of the disease, who would not otherwise have sought advice until a much later stage. Periodical and systematic examinations, with adequate treatment and supervision of those found infected is a prophylactive measure of supreme importance.

(6) Provision of sputum bottles, drugs, etc., as found necessary.

(7) Bacteriological examination of sputum, etc., for the presence of the tubercle bacillus of every centre, where not otherwise provided for.

(8) Instruction of patients and the public generally by means of lectures, illustrated by lantern slides or diagrams, models, etc., and couched in plain, untechnical language, and by means of literature in the form of pictorial handbills, pamphlets written in a popular style, etc.

The lectures and literature should deal with the causes of infection, and how to avoid them, the advantage of fresh air and wholesome and appropriate diet, the need of cleanliness and all the facts of popular hygiene with a special bearing on the subject.

(9) The after-care of patients discharged from sanatoria. Sanatoria cannot do for consumptives what the isolation hospital can accomplish for other infectious diseases. A scarlet fever patient returns from an isolation hospital not only cured of the disease after a definite term of residence there, but actually immune against it for a time at least, and he no longer constitutes a danger to the community. The case is different with the consumptive. He returns from the sanatorium, with, it may be, the disease arrested and his general condition improved. On returning to his former environment he tends to return to his old ways of living, and, in consequence, the disease tends to show signs of recrudescence, and he becomes again actively infective and is again a source of danger to the community. In the acute infectious diseases the patient's time of infectivity may be measured by a period of weeks, but in the case of pulmonary tuberculosis the time of infectivity is practically concurrent with the existence of the disease. Under these circumstances, it is obviously necessary to continue the supervision of the case after discharge from the sanatorium, and to accomplish this end the discharge of every patient should be notified to the Central Public Health Department, so that they may, through the medium of the Central Bureau, ensure that the case may be followed up, and his future life supervised and regulated.

II.—The Sanatorium.

The functions of the sanatorium are both educative and curative. Patients in a sanatorium are brought under the influence of a regime calculated to impress them with the importance of a hygienic mode of life, and they leave the institution possessing knowledge which can be applied to their every-day life and equipped as missionaries to spread the gospel of health among those with whom they come into contact. From the curative point of view the sanatorium has a distinct place in the scheme; but as an isolated agency, without being linked up to the various other items in a properly co-ordinated scheme, it is an expensive and comparatively inefficient measure. The sanatorium as an isolated means of dealing with tuberculosis in the masses has been tried and found wanting. Its field of usefulness must always be strictly limited, and the enormous expense entailed in achieving results of very questionable value is prohibitive. Much of the failure of sanatorium treatment must be attributed to the faulty selection of cases. It is useless to expect sanatorium treatment to cure advanced and hopeless cases, and it is a needless expenditure of money and energy to invite it to try. If treatment be undertaken at a reasonably early stage, the results from sanatorium treatment are distinctly encouraging, and will be much more so when sanatorium treatment is followed up by supervision and, when necessary, supplementary treatment at the Central Tuberculosis Bureau. These facts make it abundantly clear that persons, before being sent to sanatoria, should be selected with the greatest care by experts in tuberculosis work, and should, after discharge, be followed up and kept under observation by an agency capable of taking measures with the view to preventing the recrudescence of the disease. For both purposes a Central Tuberculosis Bureau or Bureaux under the charge of the Department of Public Health is a necessary *desideratum*.

III.—Hospitals for Advanced Cases.

The highly infective nature of the disease in advanced cases has already been referred to, and the necessity, from the public health point of view, of the complete segregation of such cases. Such institutions may be incorporated as a part of the sanatorium, the patients being, of course, kept apart from early cases, or a ward block attached to the isolation hospital may be made use of. It is necessary to avoid the stigma naturally attached in the minds of the patients and their friends to a "home for the dying," by providing attractive and cheerful accommodation, equipped in every respect on the lines of a modern sanatorium. In Edinburgh, where the isolation of advanced cases has been carried out on a somewhat extensive scale, Dr. Maxwell Williamson[7] states that "the provision of municipal hospital accommodation for advanced cases of the disease has accomplished the highly desirable end, from the preventive point of view, of diminishing the number of deaths occurring at patients' homes from 73% to 51%, and that actually one-fifth of the whole of the deaths from this disease occur in that institution, removed from all possibility of the danger of the spread of infection to other members of the community."

IV.—The Farm Colony.

When patients are discharged from the sanatorium the change of environment entailed in the return to

their own homes usually reacts quickly in an unfavourable way on their condition. They have oftimes difficulty in finding employment, entailing straitened financial circumstances, and when employment is found it is frequently quite unsuitable. Accordingly, the idea of a working colony, where patients in whom the disease has been more or less completely arrested would, under medical supervision, undertake out-door work, graded to suit his particular requirements was conceived. He is restored to his place as a useful working member of the community, while, at the same time, the treatment of the disease is not allowed to lapse. The influence on the patient is therefore both psychological and physical. "He forms one of the productive community, and the stimulus and interest of personal effort speedily shows itself in his brightened countenance and alert bearing. The colonists are men and women once more, and happy with a sense not only of fitness but of creative activity."—Macpherson.[8]

Co-ordination of Preventive and Curative Measures.—I have endeavoured to place under review the various agencies which may be employed in the eradication of tuberculosis, with special reference to prophylactic measures. Each has its own particular function to discharge in a well-organized and efficiently co-ordinated scheme. For the purpose of this proper co-ordination I submit that the Public Health Department, presided over by its own responsible Minister, should control the following Departments, *viz.*:—

(1) Central Tuberculosis Bureau.
(2) Sanatorium.
(3) Hospital for advanced cases.
(4) Medical Inspection of School Children.
(5) Supervision and control of dairy herds.
(6) Supervision and control of dairy premises.
(7) Control of sale of diseased meat.
(8) Supervision of construction of new buildings and places of public resort, in addition to the various activities which at present constitute the work of that Department.

All the agencies enumerated are essential and integral items in the preventive machinery, and their work should be so correlated and controlled that united effort is possible. In the absence of properly co-ordinated effort overlapping must inevitably take place and efficiency be sacrificed.

"To combat consumption as a disease of the masses successfully requires the combined action of a wise Government, well-trained physicians and an intelligent people."—Knopf.[9]

References.

[1] Acland, Dyke—*Practitioner*, January, 1913.
[2] Mackenzie, Leslie—*Health and Disease*.
[3] Philip, Sir Robert, M.D.—"Address on the Presence and Prevalence of Tuberculosis in Childhood," *Edinburgh Med. Journal*, Oct., 1912.
[4] Delépine, Prof. S.—"The Share Taken by Human and Bovine Tuberculous Products in the Infection of Young Children."
[5] Philip, Sir Robert, M.D.—"The Anti-tuberculosis Programme: Co-ordination of Preventive Measures," 1908.
[6] Philip, Sir Robert, M.D.—"Public Aspects of the Prevention of Consumption," *Brit. Med. Journal*, December 1, 1906.
[7] Williamson, A. Maxwell—"The Control and Eradication of Tuberculosis," edited by Holliday Sutherland, 1911.
[8] Macpherson, A. H.—"The Control and Eradication of Tuberculosis," edited by Holliday Sutherland, 1911.
[9] Knopf, S. A.—"Tuberculosis as a Disease of the Masses, and How to Combat it" (Prize Essay, 1902).

INSECTICIDAL FUMIGATION IN SHIPS, WITH SPECIAL REFERENCE TO THE USE OF HYDROCYANIC ACID AND TO THE PREVENTION OF SHIP-BORNE YELLOW FEVER.

By **C. E. Corlette, M.D., Ch.M., D.P.H.**,
Sydney.

(*Continued from page* 387.)

It will be well to see how a large place of several floors is dealt with on land, and I cannot do better than give an abridged description of an actual case from an article by Mr. W. W. Froggatt, Government Entomologist of New South Wales, on the eradication of the *Ephestis* flour moth.[17] The building was a mill of four floors, each measuring 12,000 cubic feet, giving a total measurement of 48,000. Bagging was plugged into roof crevices, windows and cracks were pasted up, and all shoots and elevators opened up, to allow free entrance of the vapour. As each floor was treated separately, belt holes and ladder openings were closed with bags, the latter being arranged so that the operator could slip through quickly after setting things going on one floor and then drag the bags over the opening. Kerosene tins, coated inside with tar, were used as generators, three on each floor, and into each was placed, first, 192 ounces of water, and then 96 fluid ounces of commercial sulphuric acid was gently poured into the water. Two paper bags, each containing 2 lbs. broken potassium cyanide, were placed on the floor beside each generator. The charging with water and acid was started on the top floor, and the operator worked down to the bottom. Then he mounted once more to the top floor, and starting from the tin furthest from the trap-door, he dropped the bags into their respective tins. As each floor was dealt with he descended to the storey next below, closing the trap-door behind him as he went down the ladder. In this way fumigation was set going on all the four floors. Viewed through the windows of the ground floor, it was noticed that the moment the liquid soaked the paper of the bag, generation of the vapour commenced, the contents soon boiling up madly to the rim, so that the tins were charged to their utmost capacity. The room was soon filled with a fine blue haze. The mill was closed up about four o'clock one afternoon, and when opened up next morning it was found that, with the exception of a very faint trace of a smell of the vapour on the ground floor, all of it had worked out during the night. Swarms of dead blow-flies were lying round the windows, and the floors were spotted with hundreds of dead moths. Minute inspection of infested flour in the elevators and shoots proved that every caterpillar and moth was dead. A quantity of the infested flour was collected and placed in jars for observation, but none showed any signs of ger-

mination of any eggs. A report from the mill a month later showed that, to all appearances, the moth had been completely eradicated; all the eggs must have been destroyed, as well as larvæ and moths. The cost of materials used for treating this mill was less than £4, with cyanide at 10d. per lb. and sulphuric acid at 1½d. per lb.

The process of hydrocyanic acid fumigation has, up to the present time, always been carried out by generators, or a series of generators, placed in suitable positions within the space to be treated. In the generator is placed, first, water in suitable quantity, next strong commercial sulphuric acid, and, lastly, the cyanide, roughly broken up. The quantity of cyanide used per 1,000 cubic feet has varied a good deal. On certain Australian steamships the amount is as little as six ounces per 1,000 cubic feet. G. W. Herrick,[18] who has had a large practical experience with fumigation work, advises ten ounces per 1,000 cubic feet in houses, and states that this amount kills both bugs and their eggs efficiently. Ten ounces is mentioned as enough to provide an excess of fumigant, compensating for loss by rapid diffusion through walls and unnoticed or insufficiently sealed chinks, causing progressive reduction of strength. In a gas-tight space, smaller quantities would be enough. For tent work in orchards, where loss is very rapid, 1 lb. per 1,000 cubic feet is required to produce sufficient concentration. The same amount is generally used for mill work, and it is also the amount used in New South Wales for treating fruit intended for export. We may expect that a loosely-constructed dwelling would also certainly require a fully liberal dosage. The period of exposure for indoor work is from three to six hours. In this connexion, C. L. Penny[19] has done a great deal of interesting experimental work. He showed that loss through the walls and ceiling of a large room, built of brick and plaster, reduced the amount of hydrocyanic acid vapour in one hour to rather less than half, and after 4¼ hours it was reduced to less than a quarter of the original quantity. He remarks that the loss would probably be less in a room built of boards.

Diffusion has been referred to very frequently in the course of this paper. It appears, however, that there is need to pause here for a little to recall to notice the real meaning of the term. In a paragraph some distance back I mentioned diffusion and convection currents as two distinct factors in producing the dispersal of hydrocyanic acid vapour after fumigation had been completed. I did this because a clear conception of ventilating problems demands this analysis, and I have begun to notice that even scientific men have been snared by the fallacy when discussing the subject. Diffusion is a property of a gas or vapour tending to cause dispersal by the projectional movements of its intrinsic molecules, which are in a constant state of violent oscillation. Diffusion is in relation to the elastic pressure of the gas in the space, and it goes on producing dispersal until the pressure of the gas is equal throughout the space containing it. The mass movement of a gas which depends on its relative weight or lightness is, on the other hand, a current in the atmosphere—a convection current. Wind is exactly the same thing, on a large scale. A fog, or collection of floating dust, tobacco smoke or floating bacteria, for example, does not disperse by diffusion, and if there is no atmospheric current it remains where it is; the space is a "dead" space. Diffusion knows no "dead" spaces, as it is independent of mass currents. Certainly, dispersal is greatly assisted by ventilating currents, but gaseous molecules will disperse in all directions, and against the action of gravity, even in the deadest of dead spaces.

In the correspondence columns of *The Medical Journal of Australia* of May 6, 1916 (p. 391), I recommended hydrocyanic acid fumigation as likely to be useful for the destruction of lice in soldiers' clothing, and I gave an account of the method used in the Australian steamships referred to above. If the fumigation chambers used for the purpose were not gas-tight, and permitted the escape of vapour, or if experience showed that it was better to increase the dose if the space were closely packed with clothing, an increase to 1 lb. or more per 1,000 cubic feet would not be an expensive matter. If the four storeys of the mill described above had been equipped with closely set lines laden with clothes, it could have accommodated a good many thousand pieces, and the total cost of materials was less than £4.

A further remark prompts itself, that, if hydrocyanic acid is so efficient in eradicating bugs and their eggs, it should be worth trying, not only against lice, but against ticks, which form a house plague in many parts of the world, and which are known to be vectors of more than one dangerous protozoal disease attacking man.

It should be mentioned that, as with carbon bisulphide, so also with hydrocyanic acid, the insecticidal power has been found to be enhanced by a raised temperature, and correspondingly diminished by a low temperature. So, if further experience showed it to be desirable, we could combine heat fumigation with the chemical fumigant.

Returning once more to technical practice, having established the approximate dosage of cyanide per 1,000 cubic feet, we have to discover the best proportions for mixing the ingredients in the generator. Up till recently, potassium cyanide has been employed to the exclusion of any other cyanide for the production of fumigant, and it has been used with very varying proportions of water and acid. The theoretical proportion, calculated according to chemical equivalents, is not the best in practice. If there is too little water in proportion to the acid a cake of acid potassium sulphate forms, which clogs and slows the production, while too much water lessens the temperature of the mixture and decreases the output, both per unit of time and also absolutely, by taking up the product in solution. To get a good yield of fumigant, it is very important that the cyanide should be added to the mixture of water and acid while it is hot; the heat is, of course, produced by the mixture of water and acid. The whole question of production has been carefully studied by C. C. McDonnell[20] and R. S. Woglum[21] from several points of view, and their original papers should be consulted by all who take an intelligent

scientific interest in the matters dealt with. Woglum advises for house work the following proportions: For each ounce of potassium cyanide use one fluid ounce of commercial sulphuric acid, and two fluid ounces of water. For field work he recommends three fluid ounces of water instead of two. With two ounces of water one gets formation of "cake," with three ounces no caking occurs. Three ounces gives a more rapid and even generation, but two ounces gives a larger yield, owing to higher temperature and less water; but the output is not so rapid.

The potassium cyanide used in fumigation, like most potassium salts all over the world, has always been imported from Germany, and is known in California as "German cyanide." But there is another cyanide much used in metallurgical work, and quite freely available, known as "American cyanide," and the purest commercial grade of it is known as "130% cyanide." McDonnell[22] has shown that this can be used quite as easily as the potassium cyanide, but that the mixing proportions must be different, and one-fourth less weight of it is required, because the yield is so much greater; the reason for this is, of course, quite obvious to a chemist. McDonnell's formula for producing fumigant from sodium cyanide is: Cyanide, 3 ounces; acid, 4 fluid ounces; water, 6 fluid ounces. Woglum[22] has modified this formula for practical use into the proportions, 1—1½—2. This he recommends as highly satisfactory. Low grades of cyanide are met with in commerce, containing a considerable percentage of common salt. McDonnell has shown that if this is present, hydrochloric acid is generated at the same time as hydrocyanic, when the material is brought into contact with strong sulphuric acid. The hydrochloric combines vigorously with the hydrocyanic, thereby binding it and putting it out of action, the practical result being that the whole operation is reduced to futility. It is therefore absolutely necessary to specify and to purchase only the high-grade cyanides, the 98% if potassium cyanide is used, the 130% if sodium cyanide. There is no difficulty in getting the high-grade material. Fumigation can be carried out more cheaply by using sodium cyanide in preference to potassium cyanide, at least in California; there is also less tendency to the formation of "cake."

We may now return once more to the question of risk in connexion with hydrocyanic acid fumigation. So far as I know, the method adopted for bug-killing on ships has been essentially the same as that described above in the case of a flour mill. It is defended as quite safe when carried out by men of ordinary intelligence. But there are some people—wiser people, I think—who prefer to work more cautiously. They do not drop the cyanide into the generators by hand and then run out. They suspend the bags of cyanide over the generator by a cord, passing over block and pulley near the ceiling and led outside the building. By this arrangement the bag can be let down into the generator by lowering it from without. It is not difficult to arrange for a series of generators to be worked from one outside cord. Illustrations of such an arrangement can be seen in several American and South African publications, amongst which is Herrick's book, "Insects Injurious to the Household and Annoying to Man," published by The Macmillan Co., New York, 1914, pp. 470. I recommend everyone interested to get this book, which is by far the best one on the subject. It adds a useful bibliography to its other advantages. Besides the method by pulley and cords, there are other sufficiently obvious schemes that could be devised; but their elaboration may be left to the ingenuity of the handy man.

I have good reason for advising, further, that every person working in close contiguity to hydrocyanic acid vapour should wear an adequately protective gas mask. I certainly can say from my own personal experience that the direct manual method of operating is liable to injure the health of men habitually engaged in it. I had one of these men under constant observation for several years, and, during the whole of that time, he suffered from a severe chronic cough, directly assignable to the inhalation of dilute fumes of hydrocyanic acid. This cough always improved or nearly disappeared when he took a holiday, and when, after much advice, he at length gave up fumigation work, his cough disappeared almost completely. On one occasion during fumigation of a ship's living quarters, by some mischance the door was not immediately locked, and a drunken fireman got in. The operator rushed in to the rescue, picked up the man, and carried him out. Both he and the fireman were nearly killed there and then, but came round after a time. He was then taken home to bed, but was at once seized with a most alarming and dangerous attack of dyspnœa, continuing more or less for some hours. I saw him during the paroxysm, sitting up in an agonizing fight for breath. This was followed by a very severe attack of bronchitis, with a gradual recovery. The incident occurred before the days of the great war and of the German gas attacks in Flanders. It is said that the Germans used chlorine; but the symptoms produced were very similar in their after-effects to this case of hydrocyanic acid poisoning, so much so that I have taken leave to suspect that, perhaps, a cyanogen compound could have been also present in the German gas, cyanogen chloride, for instance. This is a very pungent and poisonous heavier-than-air gas, formed by the action of chlorine on aqueous hydrocyanic acid. If it be not so, it would seem that the later symptoms, as well as the earlier, are not referable to a secondary specific poisoning, but simply to the causticity of the vapour inhaled.

We have now to consider whether a method of procedure like that adopted on land for a flour mill is likely to be suitable if a whole ship is to be treated. It seems to me that it is not. It may be admissible for limited spaces on a single floor-level, such as the living quarters of seamen and firemen, though even then there is definite evidence that when the purely manual method is adopted it is liable to injure the health of an operator habitually engaged in such work. But it has to be remembered that hydrocyanic acid vapour is lighter than air, and it will be very much more so when hot from the generator. It is all very well to begin on the top floor of a mill and work downwards; but the operator on board ship

cannot get out at the bottom. And if he reverses the order and begins work at the bottom of the ship, he will be caught as he works upwards. Moreover, there would be another very difficult problem to solve if a hold full of cargo had to be fumigated.

In several of the principal American shipping ports, the United States Government has adopted the use of a system for the fumigation of ships which, as I venture to think, offers a complete solution of the problem. With this system it is a matter of the greatest ease to introduce a poisonous vapour, or, if desired, first one fumigant and then another, to every part of a ship at practically any desired temperature, for an unlimited time, and at a prodigious rate—180,000 cubic feet an hour—and keep it there at a slight positive pressure. The fumigant is kept in contact as long as required, and is then quickly and completely blown out with fresh air—just as quickly as it was introduced. This is the invention of an Australian, Dr. George Harker, of the Sydney University. It is known as the Harker Patent Fire Extinguisher and Fumigator, and a short general description of it, in both its functions, may prove of interest.

The primary intention of the Harker invention is the prevention or extinguishing of fires in closed spaces, such as the holds and bunkers of ships. Dr. Harker has made use of the fact, shown by the experimental work of Clowes and others, that, under ordinary conditions, an atmosphere containing less than about 16% of oxygen is incapable of supporting combustion-by-ignition, *i.e.*, fire. This covers also, of necessity, explosions of inflammable gas or dust. With a pre-heated air-current, a larger percentage of the oxygen can be combined. The air supply entering a thick fire becomes heated as it passes through the incandescent mass of fuel, and is thus enabled to part with more and more oxygen the hotter it becomes, till, by the time it has passed through and become flue-gas, the oxygen has been reduced to 10% or less. The flue-gas also contains the various products of combustion, including a proportion of carbon monoxide, together with sooty matter. The whole forms the "smoke." Dr. Harker takes the smoke, washes the soot out of it very completely, and cools it to a suitable temperature, in a stream of sea-water, and then blows it by a powerful fan through a conduit pipe into the hold or bunker-space. In case of fire, the Harker gas stops the flames as soon as it has reduced the oxygen percentage of the space near the fire below 16. When the percentage is a fraction lower, all combustion ceases. With a delivery of gas at the rate of 180,000 cubic feet an hour, this point will be reached in a few minutes. The supply of material, smoke—and sea-water for cleaning and cooling it—is unlimited. The gas is blown in until the heated mass at the site of fire has been cooled right down by the current. Otherwise, re-admission of air might re-start the fire if any part of the mass remained above ignition temperature, for this point would serve the purpose of a match to the rest.

The Melbourne Harbour Trust has recently equipped itself with a launch mounting one of these machines for use as a fire-float at the port.

The carbon monoxide content of Harker gas renders it poisonous to man, and also to rats, but not to insects. I understand that the American Government authorities direct their attention chiefly to the destruction of rats, as a preventive to the introduction of plague. The gas is a complete success for that purpose.

For insect destruction, we could raise the temperature of the gas, and keep it there till the heat had done its work. But what we want is something as certain as can be. In ships, there will always be uncertainty with heat alone. Along the sides of the vessel in outside contact with water there would be little chance of killing by heat, and it would also probably fail, to a large extent, in cargo-filled spaces, if one were venturesome enough to attempt it on such material.

It seems that a poisonous vapour offers the only means of getting at, and killing, insects with the certainty that a disease-prevention campaign should always aim at. The effect of the vapour could be materially assisted, if so desired, by introducing it at a fairly high temperature, for, as we have already seen, the activity of both carbon bisulphide and hydrocyanic acid is much enhanced in this way, so much so that we are told that the dosage can be greatly reduced. However, if we agree to use one of these fumigants, the total cost is not so great as to make the temptation to reduce dosage a very pressing one, especially in regard to hydrocyanic acid. Whether this be so or not, it is only with the Harker apparatus and flue-gas that we could make a practical and economical use of the advantages of a raised temperature in ship work.

As far as the evidence goes, it seems practically certain that hydrocyanic acid is by far the most convenient, most effective, and also the cheapest chemical insect eradicator on land, excepting for weevils, and if it can be used as safely on board ship, it is the one that must be adopted. It is not necessary for rats; but it will, of course, kill rats quite certainly, and with the rats it will kill the fleas infesting them.

If it be desired to fumigate living quarters with hydrocyanic acid in conjunction with a blower system, it is quite a simple matter to introduce some irritating substance, such as volatile oil of mustard, into the current as a preliminary to the poison. After sufficient preparation of this kind, the hydrocyanic acid can be introduced.

If we wished, for some reason, to employ carbon bisulphide fumigation on board ship, it would be quite out of the question to do it except in mixture with a fire-extinctive gas. The history of the industrial employment of carbon bisulphide is one thickly studded with the stories of explosions, death and damage. It has never been possible to use it on a large scale as a fumigant, owing to this danger. It has made the difficulties of insurance practically insuperable, and it is the reason why it has never been possible to use it in grain elevators for the destruction of weevil. There is no doubt that Dr. Harker's invention provides a way out of this difficulty. However, to pursue this point any further

would carry us away from the main subject of this paper.

We have of late years been learning so much as to the part which insects can play in the spreading of disease that it is of great importance to have a system ready and in working order that we can trust, and not to depend on hasty improvisations and make-shifts at the moment when sudden war has to be declared on an insect foe. It seems to me a very desirable thing that port sanitary authorities and their officers should become thoroughly familiar with insecticidal operations, and that whatever work is done should be done, not only without fumbling and uncertainty, but with the confidence and absence of timidity that practical experience with their weapon of attack will give. Furthermore, fumigation work should in future be carried out in such a way that the actual workers should not be exposed to avoidable risk. No chemical fumigant that will do any good can be anything but poisonous, and nothing of the sort can be entirely proof against human fallibility. There are many things on board ship that cannot be made accident-proof; hatchways, gang-planks, steam-pipes, ammonia-cylinders, and machinery present ready potentialities of risk, and all share this with fumigants. Precautions are taken, and they will sometimes fail with fumigants as with the other things.

The Commonwealth Government have now followed the lead of the American Government, and will shortly be using a Harker machine in connexion with the Quarantine Department. This is a step in the right direction, and must result in a great improvement in the efficiency of ship fumigation work.

Note.—I have to thank Mr. W. W. Froggatt, Government Entomologist of New South Wales, for much generously-given information and other help, and in particular for the use of his library. Mr. Froggatt has made the task of consulting many necessary references a comparatively easy one.

References.

[1] G. M. Giles—"Handbook of the Gnats or Mosquitoes," John Bale, Sons & Danielsson, London, 2nd Ed., 1902, p. 530.
[2] R. Harcourt—"Effect of Mill Fumigants upon Flour," 36th Ann. Rep. Ontario Agric. Coll., pp. 87-92, 1911.
[3] R. Balfour—"Investigation of the Inflammability of Some Insulating Materials," and Appendix A, by Dr. W. Rosenhaim, National Physical Laboratory, *Proc. Cold Storage and Ice Association*, London, XI., No. 1, 1912-1913.
[4] Blacklock—*Annals of Tropical Medicine and Parasitology*, Vol. VI., pp. 415-428, Dec., 1912.
[5] Quoted by Bacot—*Brit. Med. Journ.*, Jan. 29, 1916, p. 167, from unpublished Report of West Africa Yellow Fever Commission.
[6] A. W. Bacot—*Bull. of Entom. Research*, Vol. V., pp. 111-117, Sept., 1914, and *Brit. Med. Journ.*, Jan. 29, 1916, p. 167.
[7] E. P. Felt—*27th Rep. of State Entomologist on Injurious and Other Insects of the State of New York*, p. 93, Jan., 1912 (Pub. Univ. of State of N.Y., Albany).
[8] A. W. Bacot—"The Temperature Necessary for the Destruction of Lice and Their Eggs," *Brit. Med. Journ.*, Jan. 29, 1916, p. 167.
[9] E. Bourcart—"Insecticides, Fungicides, and Weed-killers," Scott, Greenwood & Son, London, 1913, p. 31.
[10] Geo. A. Dean—"Heat as a Means of Controlling Insects," *Journ. Econ. Entom.*, Vol. IV., pp. 142-159, 1911, and "Further Data on Heat as a Means of Controlling Mill Insects," *Journ. Econ. Entom.*, Vol. VI., pp. 40-55, 1913.
[11] G. W. Herrick—"Insects Injurious to the Household and Annoying to Man," The Macmillan Co., New York, p. 441.
[12] W. C. O'Kane—"Injurious Insects," The Macmillan Co., New York, 1912, p. 80.
[13] W. E. Hinds and W. F. Turner—"Carbon Bisulphide for the Rice Weevil," *Journ. Econ. Entom.*, Vol. III., pp. 47-56, 1910.
[14] R. Harcourt—See Ref. 2.
[15] Von Schwartz—"Fire and Explosion Risks," Charles Griffin & Co., London, 1904, p. 278.
[16] R. S. Woglum—"Fumigation of Citrus Trees," *Bull.* 90, *Part* I., Bur. Entom., U.S. Dep. Agric., 1911, p. 80.
[17] W. W. Froggatt—"The Mediterranean Flour Moth," *N.S.W. Agric. Gaz.*, Dec., 1910, pp. 1076-1081.
[18] G. W. Herrick—See Ref. 11, p. 445.
[19] C. L. Penny—*12th Rep. Delaware Agric. Exper. Stat.*, Abstract by W. G. Johnson, "Fumigation Methods," Orange Judd Co., New York, 1913, Chapter XVIII.
[20] C. C. McDonnell—"Chemistry of Fumigation with Hydrocyanic Acid Gas," *Bull.* 90, *Part* III., Bur. Ent., U.S. Dep. Agric., 1911.
[21] R. S. Woglum—See Ref. 15.
[22] C. C. McDonnell—See Ref. 19, and R. S. Woglum, "The Value of Sodium Cyanide for Fumigation Purposes," *Bull.* 90, *Part* II., Bur. Ent., U.S. Dep. Agric., 1911.

THE THYROID MECHANISM AND ITS RELATION TO ENDEMIC AND THYROTOXIC GOITRE.

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Thyroid enlargement, commonly styled "goître," is not a disease, but a hypertrophy, resulting from some cause which is making constant demand for its secretion.

The cause in the majority of cases is toxic in nature, and most frequently from some septic focus, from which toxins are poured continuously into the system. The thyroid secretion is in some way necessary for its destruction. Thyroid enlargement, exclusive of malignant disease and the growing of adenomata in the thyroid, assumes two main types, which pass under the headings of endemic goître on the one hand and thyrotoxic goître or Graves' disease on the other. What are the distinctive characteristics, and how can they be linked up together?

Taking the facts that are known about each and comparing them, the following points become apparent:—

	Endemic.	Thyrotoxic.
Locality	Chiefly seen in limestone districts	Seen very frequently in districts deficient in lime
Size	Often very large	Size not in relation to severity of symptoms, and rarely so large as the big endemic type
Symptoms	Often with signs of marked thyroid deficiency No thyrotoxic symptoms Pressure symptoms most common	Marked signs of increased thyroid secretion
Iodine Content	Very low	Very high
Calcium Content of Blood and Tissues	? Author's views suggest calcium retention	Marked depletion

	Endemic.	Thyrotoxic.
Coagulability of Blood	?	Deficient; many cases almost to be classed as "bleeders"
Histological Examination	Retention of colloid forming large cysts	Vesicles empty, great vascular engorgement, and a deteriorated state of cells lining vesicles

When these items are viewed carefully, it will be seen that the thyroid mechanism is very closely associated with calcium and iodine, and really depends upon a proper balance of these two elements being maintained.

In countries where lime is in excess, goître tends to the endemic type, without thyrotoxic symptoms, such as Switzerland and Derbyshire. Whereas in Gippsland, where calcium is deficient, goître appears with more of the thyrotoxic symptoms.

In endemic goître, iodine is very deficient, whereas in thyrotoxic goître it is in excess. If iodine or thyroid extract containing iodine is given in endemic goître the mass diminishes or even vanishes. In other words, the retained secretion, which is a colloid, is brought into a more soluble state, and is absorbed.

Mention might be made here of the well-known fact that a small quantity of iodide added to gelatine will reduce its rigidity to a very marked extent.

One of the essential elements for coagulation is the presence of calcium; further coagulation varies largely according to the amount of calcium present. Iodine given internally causes the absorption of retained colloid, and we can therefore assume that it has liquified the colloid and enabled it to be utilized by the body.

On the other hand, in thyrotoxic goître, where we find the vesicles empty, the iodine in excess and calcium diminished, the secretion is being poured constantly into the blood, there being no retention in the thyroid and no possibility of any retention as long as the rigidity of the colloid is so reduced by the excess of iodine and diminution of calcium. From these data it is reasonable to assume that the control of the thyroid secretion entering the blood depends upon a normal balance of iodine and calcium.

If one or the other is in excess retention results in the case of calcium excess and a constant outpouring in the case of iodine excess. With deficient calcium increased out of secretion and with deficient iodine, colloid retention results.

The normal thyroid always contains a certain amount of secretion in the form of colloid ready for use in such a form or of such rigidity that it is readily absorbed when the need is present. In endemic goître no amount of stimulus seems to be able to bring the secretion in sufficient quantities into the blood, and the result is often marked signs of subthyroidism in the individual.

In thyrotoxic goître the administration of calcium, particularly in the milder forms, materially assists and probably helps to increase the rigidity of the colloid and tends to delay its absorption or too ready access to the blood.

References.

[1] A. Rendle Short—"The Newer Physiology in Surgical and General Practice," p. 75.

Reports of Cases.

A LARGE OVARIAN CYST.

By G. P. O'Day, M.B., B.S.,
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Miss J., æt. 20 years, was admitted to the Women's Hospital, Melbourne, under the care of Dr. F. W. W. Morton. She gave the following history:

Normal menstruation had begun at 14 years of age. The periods had become more frequent and more profuse at 15. She noticed an abdominal swelling soon after. The swelling increased gradually. Her menses ceased 18 months before admission.

On admission, her bowels were acting regularly and her micturition was normal. She was able to walk, and did not suffer from dyspnœa. During the previous three years she had remained indoors, as a rule, as her deformity was very obvious.

On examination, an enormous enlargement of the abdomen was seen. There was a dense network of veins in the skin. The flow of blood through the veins was toward the thorax. The costal margin and sternum were pushed far forward. The umbilicus was effaced, and the lower pole of the tumour reached almost to her knees. The lower extremities were œdematous. When lying in bed she could raise the lower pole of the tumour six inches by the mere contraction of her abdominal muscles.

Her general appearance, apart from the tumour and her lower extremities, was that of an extremely slight girl, who should not have weighed more than seven stone.

The abdominal measurements were as follows:—

(*a*) Transverse circumference	65½	inches
(*b*) Coronal circumference	68	inches
(*c*) Xiphi-sternum to symphysis pubis	42	inches

Eighteen months before she had been treated by a Chinese "doctor." The treatment had cost her £56.

Under "open" ether anæsthesia, administered by Dr. Nelly, Dr. F. W. W. Morton made a vertical incision below the umbilicus and emptied the cyst by means of a trochar. Fifteen gallons of fluid were evacuated. After an extensive area of the cyst wall had been peeled and detached from the anterior wall of the abdomen, Dr. Morton found the pedicle on the right side. He then delivered the rest of the tumour, ligatured the pedicle and removed the cyst. A thorough inspection of the abdominal viscera was carried out through the incision. They were all apparently healthy. A large cave was found in the upper segment of the abdomen. The liver lay at the apex of this cave, far removed from the lower costal margin. The abdominal wall was sutured in layers and a tube inserted into the pelvis through the lower end of the wound. Three pints of normal saline solution were administered *per rectum* at the close of the operation, while the patient was still under the effects of the anæsthetic. The fluid was retained. The patient's condition remained good throughout the operation.

The wound healed by first intention. The legs rapidly regained their natural size. She stayed in Hospital for six weeks. At the time of her discharge the costal margin had retracted well, and much of the slack skin over the abdomen had disappeared.

The tumour was a multilocular ovarian cystadenoma, containing 16 gallons of fluid and weighing 119 pounds. Notwithstanding its great size and weight, it had interfered very slightly with the patient's vital functions. There was no evidence of shock resulting from its removal. It is interesting and instructive to note that Nature unassisted, save by rest, removed the greater part of the deformity remaining within a very short space of time.

I have to thank Dr. F. W. W. Morton for permission to publish the notes of this remarkable case.

The Medical Journal of Australia.

SATURDAY, NOVEMBER 11, 1916.

Co-ordination in the Combating of Tuberculosis.

In the year 1887, Dr. R. W. Philip (now Sir Robert Philip) evolved a scheme for the control of tuberculosis in man, which he named the "Edinburgh Co-ordinated Anti-tuberculosis System." The basis of the scheme was to extend the assistance given to consumptives to their homes, in order that those in close association with the recognized patients might be examined, and every case in the incipient stages of the disease placed under immediate control. In his scheme the Royal Victoria Dispensary for Consumption served as the central element, and with it were linked up the various agencies by means of which the Public Health Department and those in authority at the Dispensary might exercise a prophylactic or healing influence over the whole community. He conceived the idea that the only way to attack a disease as widespread as tuberculosis would be to assume that the general community embraced many persons suffering from tuberculosis in its early stage, and that the first essential would be to discover these foci of infection. By means of adequate measures, persons included in this class could be given a better chance of ultimate recovery, and at the same time could be prevented from disseminating the disease. The second group of persons were those in whom the disease was manifest. These persons required additional measures, in order that a satisfactory percentage might be placed in a position to work and earn a living. Lastly, there were the advanced cases, in persons whose chances of relative cure were non-existent. For them he planned amelioration, and those measures which would render them no longer a danger to others. For these purposes Dr. Philip included in his scheme, in addition to the central dispensary, the sanatorium, the farm colony for persons whose disease was arrested, and the hospital for advanced cases. The open-air school also loomed large in the Edinburgh plan.

Dr. J. King Patrick gives a detailed account of his suggested modification of this system of co-ordinated effort to stamp out tuberculosis. He has considered the integral parts of Sir Robert Philip's scheme, and has recast the machinery for attacking the problem. The care bestowed on these details, and the logical sequence of the arguments employed cannot fail to attract attention, and to further the object in view. The practical value of the co-ordinated scheme is assured, but Dr. King Patrick appears to be satisfied to advocate measures without adducing figures to prove their value. Fortunately, statistical evidence of the value of the Edinburgh scheme has been presented, and an unmistakable reduction in the mortality, as a result of the introduction of the plan, has been claimed some 14 years after its introduction. It must, however, be insisted on that an extraordinary reduction in the tuberculosis mortality has been effected in England and Wales from the year 1855, that is long before any co-ordinated scheme was dreamed of. No doubt many factors participated in this gradual improvement, but it is usually held that the improvement in the housing conditions and the better care of the destitute were the main measures responsible for it. The death-rate from pulmonary and miliary tuberculosis per 10,000 of population in England and Wales was still 10.0 in 1913, while in 1914, in Australia, it was 6.3. We should, therefore, not be satisfied with the means at present employed, but seek for fresh, and even more potent, weapons to attack the problems. For this reason, it seems as if the co-ordinated scheme were incomplete and limited in its promise of success, as long as it does not contain ample provision for research and for the investigation of phenomena which are still awaiting solution. It is not improbable that many of the views held at present in regard to the spread of the disease may have to be modified not inconsiderably when more knowledge is obtained. To be satisfied that we know enough in any branch of medicine is to court disaster.

THE IMPORTANCE OF FIGURES.

It has been said that figures can be used to prove anything. While there is good ground for distrust in deductions made from statistics prepared for the particular purpose of advancing a theory, or refuting one, the wholesale condemnation of mathematical calculations for scientific purposes is quite unjustified. Statistical returns, carefully presented, are of immense importance in medicine, provided that the facts which they record have been definitely established. It is to be feared that the most valuable and reliable figures which are available for the medical profession are usually dismissed with but scant attention. Few medical men have given heed to the vital statistics, compiled with great care by our excellent Commonwealth Statistician and the statisticians attached to the six Australian States. Those who neglect to learn from the returns published periodically fail to obtain a wide grasp of many problems in public health, and exclude from their purview a consideration of numerous factors which influence the prevention of disease and death. It must be remembered that the medical profession has but two primary functions. The first and more important is the prevention of disease, while the second is the cure of established disease, or its amelioration. It is an unfortunate fact that morbidity figures are never quite reliable, and are always restricted to certain notifiable infections, and to chance incidence, such as may be found in the practice of a single practitioner or a public hospital. Moreover, the figures obtained of the extent of diseases are not only incomplete, but are consequently actual and not relative. The hygienist cannot make headway on the fact that a hundred persons within a certain area and a certain span of time have suffered from a named complaint. He wants to know what the relative frequency of the disease is in the total population, and what it was when different elements and conditions varied. Much more information is to be gained from the mortality rates. But here, again, there are certain defects which are difficult to measure. In the first place, errors in diagnosis vitiate the returns. The statisticians are not responsible for indefinite or erroneous diagnoses, and are compelled to accept the medical practitioners' statements as to the causes of death. In the second place, the classification adopted is usually the Bertillon, which, in our opinion, leads to many gross misrepresentations of fact. Finally, the value of statistics, giving the number of deaths from each disease, or pathological condition, loses materially when the total number of cases of the disease or condition is unknown. It will thus be seen that many of the defects appertaining to the recording of morbidity and mortality statistics are due to the want of interest and care on the part of medical practitioners. If notification of disease were general, and not limited to a selected few, if the notifying practitioner were to inform the health authority whether the diagnosis were based on clinical impressions alone, or confirmed by laboratory or pathological findings, and if all causes of death were verified by post-mortem examination and minute analysis, the task of discovering the factors in the ætiology of the various diseases would be simplified, and preventive medicine would obtain great assistance.

The statistical returns regarding births and marriages stand in a different category. The returns are made from figures which may be taken as correct. Relative as well as absolute calculations can be arrived at, and from the wealth of information at the disposal of the statistician some important deductions can be drawn. The Federal Statistician dissects the returns, and analyses them from multitudinous points of view. Some of his tables are published annually in the *Commonwealth Year Book*, while others of greater detail should be sought in the volume entitled *Demography*. The Year Book, dealing with statistics collected for a series of years up to the end of 1914, is now available, and from it the profession should seek knowledge. Some account of the information available concerning the vital statistics will be given in these columns. When it is remembered that Mr. Knibbs collects his figures, turns them this way and that, seeks the significance of the results of combination of various circumstances, and presents certain problems from different points of view without seeking to prove any one thing, or to establish any special theory, it will be recognized that this material has a very high value.

Medical men will be wise if they pay much attention to these records, and if they were to consider them from the aspect of the problems in public health, their value would be much enhanced.

PHYSIOLOGICAL CLIMATOLOGY.

The small range of the variation in the temperature of the human body depends mainly on some mechanism which regulates the rate at which heat is lost from the surface of the body and through the lungs. As the temperature of the body rises and falls with increased or lessened oxidation, the amount of heat removed from the body will necessarily be altered. By varying the quantity of blood circulating through the skin, and by increasing, when needed, the secretion of sweat on the superficial parts of the body, the human organism possesses ample means for controlling the loss of heat.

The efficiency of this physiological mechanism for cooling the body will be greatly affected by the climatic conditions which surround it. The physical processes by whose operations heat leaves the body are radiation, convection and evaporation. Loss of heat by radiation is dependant on the difference between the temperature of the surface of the body and the temperatures of the air and surrounding objects. Removal of heat by convection will vary with the rate at which the air (or water), brought into contact with the body, is carried away. The cooling by evaporation will be regulated by the humidity of the air and the speed of the wind. In describing any climatic conditions which will influence the temperature of the body, it will, at least, be needful to state the temperature, the degree of saturation of the air with moisture, and the amount of movement of the atmosphere, since all these factors are concerned.

The comfort of a person is much affected by the action of the physiological apparatus adjusting the bodily temperature. When the external conditions do not favour the rapid elimination of heat, exertion, with its increased oxidation, causes overheating, with its consequent discomfort of hot skin and profuse perspiration. The unfavourable conditions in any climate are a temperature of the atmosphere approaching or exceeding that of the body, little or no wind and a high degree of saturation of the air with moisture. Since there are three factors, it becomes difficult to estimate their effects, even when adequate figures are provided. Not only so, but the subject is a difficult one, and the working out of a result cannot be readily accomplished.

Meteorologists are usually satisfied to present the information separately under the headings, temperature, wind and humidity. The average person in the community is usually satisfied with a knowledge of the temperature in forming a judgement as to the desirability of a climate. While it must be granted that no other single factor gives so much information, it is obvious that the readings of temperature by themselves are of limited utility. A day with a temperature of 85° F., with a breeze of fifteen miles an hour, and with the humidity of the air at 40% of saturation, will offer comfortable conditions. On the other hand, a day at the same temperature, with no wind and a humidity of 80% of saturation, will be most oppressive. The educated person has usually some acquaintance with the general effects of moisture in the air, though unable to calculate its influence numerically. With the object of providing information in which the effects of air movements, moisture and temperature are taken into account it has been suggested that more attention should be paid to the readings of the wet-bulb thermometer. These readings have been named "sensible temperatures," and wet-bulb isotherms have been occasionally plotted. Thus, Mr. H. A. Hunt, Meteorologist to the Commonwealth of Australia, has drawn the wet-bulb isotherms for each month of the year 1910 on the map of Australia. Haldane has shown that there is a critical temperature, as measured by the wet-bulb thermometer, at which the body cannot lose heat sufficiently fast, even at rest, so that cumulative fever results.

Professor W. A. Osborne,[1] who has continued his studies on the effects of climate, has endeavoured to determine the wet-bulb temperature above which tropical conditions of discomfort are felt. He places the dividing line between comfort and discomfort at 73° F. wet-bulb. In selecting this guide, which is only regarded as a rough indication, he has been influenced by the amount of clothes needed when lying completely at rest in an open-mesh hammock in a good shade. He adopted this method after he had failed to get satisfactory results by weighing his clothes to estimate the amount of sweat.

The wet-bulb thermometer is at times unable to register changes which are readily appreciated by the human body. When the north wind drops and the sky becomes overcast, heralding the approach of a "change" at the end of hot weather in Victoria, the air conditions are most oppressive, and sweating is copious on the slightest exertion. The readings of the wet-bulb thermometer usually fall, though on two occasions Professor Osborne has noted an increased wet-bulb reading. Subsequent experiments have shown him that the wet-bulb thermometer, as ordinarily made, is not as sensitive to air currents as the human body. The raised wet-bulb temperature, which precedes a "change" in weather, is well indicated by the kata-thermometers devised by Leonard Hill. These instruments measure the time of cooling of a large wet-bulb through a range of 10° Fahrenheit. They are, however, in their present form, too sensitive to air currents in hot, dry weather.

It is to be hoped that a greater number of wet-bulb temperature readings will be taken throughout Australia, so that data will be available for forming an accurate notion of the climatic conditions of the different districts. If this were done, physicians would have a ready means of ascertaining the suitability of different places for their patients.

[1] *Proc. Roy. Society of Victoria*, September, 1916.

DEPARTMENTAL TREATMENT OF SCHOOL CHILDREN.

The following notice was published in the daily press of Sydney on November 1, 1916:—

> Mr. Griffith, Minister for Education, stated yesterday that, despite the British Medical Association, he had received 50 or 60 applications from other States of the Commonwealth and New Zealand for positions in State School Clinics. Most of the applicants were highly suitable men, and not within the military age.
>
> Dr. Willis, Principal Medical Officer of the Department, had visited Victoria and Tasmania to interview candidates, and was very pleased with the class of candidates offering. The Minister added that premises for the general clinic in Sydney had been leased, and the work of fitting it up was already in hand.

It is possible that some members of the profession may not have recognized the significance of the action taken by the New South Wales Branch of the British Medical Association in connexion with the treatment, as distinct from the inspection, of school children by departmental officers. No doubt the high salary offered may have tempted some practitioners to apply for appointment. Full information in regard to the action of the Branch can be obtained from the Honorary Secretary. The matter has been discussed at two general meetings of the Branch, which have been reported in *The Medical Journal of Australia*, of January 22, 1916, p. 82 *et seq.*, and February 12, p. 142 *et seq.*

THE WELLINGTON LODGE DISPUTE.

It is announced that the Friendly Societies in Wellington (New Zealand) have assayed to solve their difficulties by the importation from England of some "fully qualified medical practitioners with experience in general practice," to undertake the task of providing medical attendance on the Lodge patients. This action has the approval of the Minister for Internal Affairs, and it is anticipated that the registration of these imported practitioners will be facilitated by the Minister. We presume that objection will be raised to the registration by the members of the Wellington Division of the British Medical Association, and that the Medical Board will consider these objections carefully before arriving at a decision in the matter. (See *The Medical Journal of Australia*, April 29, 1916, p. 371.) We venture to suggest that the Friendly Societies have not yet removed their difficulties, and that there are some unpleasant surprises in store for them.

THE VISION OF PILOTS.

At a recent meeing of the Council of the Victorian Branch of the British Medical Association, the question of the suggested alterations in the regulations regarding the standard of vision of pilots navigating vessels through Port Phillip Heads was brought up for consideration. It was held that in this matter ophthalmologists were best qualified to speak with authority, and consequently the handling of it was left to the Eye and Ear Section of the Branch. It appears that the standard prescribed in the regulations issued in November, 1904, was a high one. The candidate applying for a pilot's certificate was required to have $^{6}/_{6}$ vision in each eye, and, further, the pupillary reflexes, the fundus, the visual fields and binocular vision were required to be normal. Any abnormality would exclude the candidate from being accepted. At re-examination a pilot was allowed to continue in his occupation provided that each eye had a vision of not less than $^{6}/_{9}$. The Marine Board has, for some unexplained reason, sacrificed the safety of the travelling public and of ships by altering this standard to one requiring a vision with both eyes of not less than $^{6}/_{12}$. The members of the Eye and Ear Section point out that this means that a man with one blind eye and one eye with half normal vision can obtain a pilot's certificate, and can hazard the lives of persons travelling when entering or leaving Port Phillip. They view with great concern the reduction in the standard, and express the opinion that the rigid standard of normal sight should be required, not only for pilots, but also for masters. They suggest that a thorough examination of the vision of all persons concerned in the navigation of ships should be undertaken after every accident occurring in Victorian waters as an essential for the protection of the lives of the people. The changes in the standard for vision of pilots, and the low standards for master mariners and enginedrivers, are signs of the times which fill the thoughtful person with uneasiness. Unionism is allowed to resort to measures which are in the interest exclusively of the worker. Australia is now experiencing a policy of selfishness, which impels sections of the masses to further their own interests, even if this entails a wanton destruction of property and an avoidable risk of life. It will be admitted that the exclusion of a man from any particular calling should not be lightly undertaken, and that every consideration should be shown to those whose unfitness for service arises from no fault of their own. But the safety of the public is paramount, and personal considerations must not be allowed to stand in the way. Mariners and engine-drivers must have good vision and a normal colour sense.

GAOLS AND PRISONS.

The annual report on gaols and prisons in South Australia for the year 1915 contains a considerable amount of information of interest to the hygienict. During the year 1629 individuals were committed to prison or confined in gaol. This number is 684 less than that for the year 1914. In addition, 111 persons served sentences of seven days and under; the total therefore amounted to 1740. The Comptroller of Prisons is of opinion that the decrease in the number of prisoners is due to a reduction in drunkenness and in offences of a public nature. The coming into operation of *The Convicted Inebriates Act* is largely responsible for the reduction. The offences for which prisoners were confined in the gaols are summarized in a table. There were 98 persons imprisoned for offences against the person, 36 for offences against property, 184 for larceny and similar offences, 11 for forgery, 3 for offences relating to coin, 346 for offences of a public nature (as against 625 for 1914), 702 for drunkenness (as against 1033 for the previous year), and 249 for other causes. One male prisoner was admitted nine times, 2 were admitted eight times, 3 were admitted seven times, and 4 were admitted six times. Two female prisoners were admitted six times, 1 five times, 2 four times, and 4 three times. Forty of the prisoners could read, but

could not write, and 72 could not read. Only 13 punishments were inflicted for breaches of the regulations.

It appears that one person out of every 1,645 of the general population was in gaol on the last day of 1915. The total prison population on December 31, 1915, was 267, of whom 106 were in the Yatala Labour Prison. The cost of maintenance and control of gaols and prisons and of the maintenance of convicted inebriates was £21,564 17s. This amount is £2,308 more than that of the preceding year. The cash earnings of the prisoners amounted to £3,128. The average yearly cost per prisoner was £59 12s. 4d., as compared with £56 5s. 5d. for the year 1914.

Since the passing of the *Habitual Criminals Amendment Act*, 1907, 17 prisoners have been declared to be habitual prisoners. There were 12 who entered the indeterminate portion of their sentences, and of these 11 have been released. The twelfth man, who had been committed for trivial offences while under the influence of alcohol, failed to comply with the conditions of his release, and was therefore returned to prison. One man, a labourer, was released in March, after having earned £19 7s. 10d in 16½ months. He purchased indulgencies to the value of £7 0s. 10d., and received the balance of £12 7s. on his release. He obtained employment pending his enlistment in the Australian Imperial Forces. Another man, a carpenter, remitted £1 per month to his mother during his imprisonment, and was released after 11 months' incarceration. The balance of his earnings amounted to £7 3s. 4d. This man has already joined the Expeditionary Forces.

In the period from December 11, 1913, to December 31, 1914, 122 persons had been declared habitual inebriates. During the year 1915 35 inebriates were released on licence and 8 had their licences revoked. The male inebriates are detained in the Gladstone Gaol, and the majority of the females in the Adelaide Gaol. One of the latter was transferred to the Parkside Hospital for the Insane. The conduct of the inebriates was good. Two were ordered solitary confinement for breaches of the regulations, and one of them was reduced to the lower grade for one month. The Comptroller considers that it is rather early to determine whether the treatment under the Act is reformative or not. Of the 16 inebriate women in the Adelaide Gaol on December 31, 1915, 9 had followed the occupation of domestic servant, 4 had been prostitutes, 1 a housewife, 1 a tailoress, and 1 an inmate of a home for the destitute. Their ages varied between 23 years and 69 years. On December 31, 1915, there were 33 male and 9 female inebriates in the Gladstone Gaol. Eighteen of the males were labourers by trade, 2 were butchers, and there were 1 photographer, 1 blacksmith, 1 coachsmith, 1 saddler, 1 mason, 1 gardener, 1 miner, 1 die setter, 1 coachbuilder, 1 seaman, 1 bricklayer, 1 carpenter, and 1 engraver. The ages of the male inebriates lay between 30 and 67 years. Of the nine female inebriates 1 was a cook and the rest had been engaged in domestic duties. It appears that the majority of the inmates are quite incapable of competing in the open labour market. Many are physically defective, and some are mentally deficient. It is suggested that these people are committed to the institution too late in their career, and have become too hardened to admit of prospects of reform.

The *Offenders Probation Act* of 1913 has been in force since February, 1914. Only two persons were placed under the supervision of a Probation Officer on their release. The conditions of the prisoners' recognizances have been satisfactorily fulfilled. The Comptroller regrets that the Courts have not taken advantage of their powers to order an offender to be placed under the supervision of a Probation Officer in lieu of passing a sentence with imprisonment.

The number of persons received at the Yatala during the year was 151. In 1914 there were 198 prisoners in this institution. The number of criminals between the ages of 18 and 20 decreased from 16, in 1914, to 6, in 1915. In the year under review 186 prisoners were discharged, including 1 who was transferred to the Hospital for Criminal Mental Defectives, and 1 who died at the Adelaide Hospital. The earnings of the prisoners amounted to £2,901 7s. 1d. The average earnings per man was £21 3s. 3d., and the average cost per man was £54 14s. 5d. The prisoners were employed in the necessary services of the prison, in the manufacture of lubricating pads for the South Australian Railways, in boot-making, tailoring, blacksmithing, and carpentering, tinsmithing, agricultural work, quarry work, etc.

The health of the prisoners was good. One man died of heart disease, 1 had an attack of pneumonia and was found on recovery to be suffering from tuberculosis, and two received serious injuries.

The Comptroller concludes his report with a general account of the Adelaide Gaol, the Gladstone Gaol, the Mount Gambier Gaol, the Port Augusta Gaol, and the Wallaroo Gaol. A series of tables is also attached, giving the statistics of the various institutions.

AN IMPERIAL CLUB FOR NURSES.

A scheme has been on foot for some time to form a club in London for the convenience of nurses of all denominations who are British subjects.

H.R.H. Princess Henry of Battenberg has consented to become the Patroness of the Club, which has the hearty approval and support of the Lord Mayor of London, the Bishop of London, the Chaplain-General of the Forces, and many leading members of the medical profession. Mr. McAdam Eccles, F.R.C.S., has been appointed Honorary Treasurer, and Miss C. H. Mayers Honorary Secretary. The sum of £5,000 is required for furnishing and other initial expenses, together with the general up-keep for two years. It is hoped that the running expenses will be defrayed by the members themselves.

Most of the war hospitals are adapted buildings, with little or no space to spare for adequate sitting and recreation rooms for the members of the nursing staff.

Many nurses from both military and civil hospitals feel the want of a place where they can meet or visit their friends when off duty, and this club is intended to supply the want. It will be of very special use to nurses who have responded to the call of the sick and wounded, and have come from every corner of the British Empire to serve their country by "doing their bit" in the Motherland. A club will be a convenient centre where they can both meet and make friends, and in many other ways it will fulfil one of the real needs in a profession that is no less self-sacrificing than hard-worked.

Any friend in Australia of this praiseworthy scheme who may wish to render practical help should communicate with the Secretary, at 52 Lower Sloane Street, London, S.W.

ALEXANDRA HOSPITAL, HOBART.

The annual report of the Alexandra Hospital, Hobart, for the year ending July 31, 1916, comprises the report of the general committee and a short report of the medical officers.

The number of patients admitted during the year was 266, but according to the medical officers there were only 204 patients admitted into the wards. There were 215 births, including 16 abnormal labours, 9 still births, and 8 premature births. Two infants died. There were three cases of twins, 4 of uterine inertia, 1 of complete inversion of the uterus, and 5 of adherent placenta. There were two face presentation cases. Craniotomy was performed once. The medical officers speak in terms of praise of the manner in which the Matron, Miss Boucher, carried out her duties. Six nurses completed their training and passed the necessary test examination.

The work of the medical staff was conducted by Drs. Gregory Sprott and E. Brettingham-Moore alone. The three other members of the staff were absent on military duty.

The income of the hospital amounted to approximately £2,000, of which the patients contributed £1,288, the nurses £179. The public subscribed £596, including donations, hospital day collections and proceeds of the Queen Carnival, and the Government gave a subsidy of £100. The balance from the last account was £126, and at the end of the year £244 remained unspent. Notwithstanding the fact that the cost of living and of maintenance generally has increased, the committee has found it possible to conduct the hospital without raising the existing fees for patients.

Abstracts from Current Medical Literature.

MEDICINE.

(167) War Nephritis.

R. G. Abercrombie gives an account of his experience of the acute stage of war nephritis after having observed 500 cases (*Journ. Army Med. Corps*, August, 1916). He regards the term "trench nephritis" misleading, as the affection occurs in soldiers who have never been in the trenches. The onset is usually rapid, and the premonitory symptoms are cold, coryza, and occasionally abdominal pain, diarrhœa and vomiting. After a short time severe headache, swelling of the face, and dyspnœa set in. Pain in the back and limbs is common. The nature of the illness may be obscure at first. The skin is usually moist, and profuse sweating sometimes sets in. Bronchitis is a very frequent co-existing condition. Dyspnœa occurs in attacks often at night. Its causation is obscure. In about one-third of the cases there is some fever, which usually passes off as the acute symptoms disappear. Pyrexia may also be due to bronchitis or convulsions. The extent of the œdema is variable. It may be slight and transient, or severe and persistent. Ascites and pleural effusion have been observed. The urine is usually diminished in quantity in the early stages. Anuria for twelve hours or more may occur. The amount of albumin varies from a trace to 1%. Hæmaturia is frequent, and blood cells, casts, epithelial cells and degenerated leucocytes may be present in the deposit. The casts are usually granular, less frequently hyaline and rarely waxy. There is often frequency of micturition and dysuria. Convulsions occurred 14 times in his 500 cases. In two cases the uræmia proved fatal. Multiple convulsions may be followed by a stupor, and even mania. Amaurosis was noted three times. The author lays stress on the behaviour of the blood pressure, which is often raised in the early stages, and descends by stages (staircase descent), or gradually as the acute phase of the disease passes off. He appends some curves of the systolic blood pressure recorded twice daily. The highest pressure ranges as a rule between 135 and 180 mm. Hg. The author describes a series of cases in which the symtoms point to inflammation of the lower urinary tract. In these cases there is no œdema, and the blood-pressure is normal, or sub-normal. The prognosis of war nephritis is good. Of the 500 patients 4 died, 2 of convulsions, and 2 of repeated hæmorrhages and exhaustion. The treatment consists in keeping the patient warm in bed, giving diluent fluids and saline purgatives. The author prefers keeping his patient on a strictly fluid diet during the acute stage. He is of the opinion that the process is an infective one, notwithstanding the fact that no pathogenic bacteria had been recovered from the urine or from the blood.

(168) Thrombo-angiitis Obliterans.

F. Parkes Weber discusses the chief features of the chronic obliterative arteritis which is seen chiefly, if not exclusively, in male Hebrews between 30 and 52 years of age (*Quarterly Journal of Medicine*, July, 1916). The patients suffer from redness or cyanosis of the feet when these are in the dependent position, from pallor of the foot when the ankle joint is moved, from intermittent claudication, and from absence of pulsation in the dorsal artery of the foot. Usually one lower limb is attacked, but the disease may spread to the other foot or to the hands. The affection advances by periods of exacerbation, alternating with long intervals of remission. The progress leads to ischæmic ulceration, acute septic complications, or gangrene. Attacks of phlebitis and venous thrombosis are not infrequent. Amputation has been sometimes employed in treating this condition, and the author shows drawings of the dorsalis pedis and popliteal arteries from two limbs removed by amputation. The patients present no evidence of syphilis. The Wassermann test has yielded negative results. The author suggests that tobacco-smoking may contribute to the cause of the affection. The patients that he has seen are addicted to consuming large numbers of cigarettes daily, and several have been employed in cigarette factories.

(169) Trench Fever.

W. P. Herringham points out that war is always accompanied by many cases of slight pyrexia, which cannot be assigned to any of those diseases of which the pathology is known (*Quarterly Journ. of Medicine*, July, 1916). About the end of April, 1915, cases of fever of short duration occurred literally by thousands among those soldiers performing duty in the trenches and among those brought into contact with the patients in hospitals and camps. The number of cases diminished during the autumn and winter, but increased with the onset of spring in 1916. The medical officers observed the relapsing nature of the disease, which led them to regard it as previously unrecognized. In typical cases the fever rises suddenly to 102° F. or 103° F., and falls within twenty-four hours to about normal. The temperature rises again on the fourth day, and reaches its second maximum on the fifth day, and falls again rapidly to the level of the healthy. This variety constitutes the saddle-backed variety of fever. As the symptoms, with the exception of the pains in the shins, are those of fever, the author states that their occurrence can hardly be said to prove a common infection for the two types. The author has discussed the two hypotheses of infection by lice and mosquitoes, and points out difficulties in accepting either of them. He says that the fever was thought to be enteric, modified by vaccination, until the bacteriological examination of hundreds of patients had failed to demonstrate any typhoid bacilli in the blood, stools or urine.

G. H. Hunt and J. W. McNee have continued their studies on trench fever (*Quarterly Journal of Medicine*, July, 1916). With Renshaw they had shown that many relapses in regular succession might occur, that the fever could be produced by the inoculation of the blood of a patient into healthy men, and that the infection was conveyed by the corpuscles and not by the serum. The authors are now in a position to define the characteristic signs and symptoms. These are headache and pains in the legs. Nasal and bronchial catarrh are absent. Diarrhœa is never seen. Two types, one of short duration and one lasting several weeks, are prevalent. The latter variety is common in winter. The natural incubation period is fourteen to twenty-four days. With inoculation the incubation period varies from five to twenty-two days, according to the method of infection. The short interval is observed with intravenous injection, and the long period with intra-muscular injections. Treatment with arsenic, salvarsan, antimony, eusol or the sera of convalescent patients has been useless in preventing the relapses of fever. Quinine and salicylates are of value in reducing the temperature and in relieving pain. These authors believe from indirect evidence that the disease is transmitted by lice, although the experiments on the direct transmission of the disease by lice from infected persons have been uniformly negative.

(170) Cerebro-spinal Fever.

A. Presslie and W. E Lindsay present a report on forty-two cases of cerebro-spinal fever, observed during the six months preceding June, 1916 (*Quarterly Journal of Medicine*, July, 1916). The diagnosis of each case has been verified by bacteriological examination. Nineteen of the patients died, thus giving a mortality of 45%. Ten cases have been treated with serum from the Lister Institute. The patients received four daily injections of 30 c.cm. of serum. Five of the ten patients died. They have found that simple lumbar puncture gives the greatest measure of relief. They have used hexamine freely, and have estimated the amount of formaldehyde appearing in the spinal fluid. They consider that the most important points in treatment are early diagnosis, daily lumbar punctures, good feeding, preferably with solid food, the use of hexamine in large doses, free action of the bowels, good nursing, with constant attention to the patient, and immediate treatment of complications. With regard to the high mortality, they are of opinion that the

mortality depends on the severity of the attacks. In this series they have had five fulminating cases.

NEUROLOGY.

(171) Intracranial Telangiectasis.

Ernest Sachs (*Amer. Journ. Med. Science*, October, 1915) reports two cases of intracranial telangiectasis. Case 1: A boy, aged 10 years, three months after a fall, had fever and convulsions confined to the left side of the body, beginning in the leg, followed by a complete but transitory left-sided paralysis. After an interval of one year there were monthly convulsions, beginning in the face, accompanied by irritability and occasional headaches and vomiting. The left knee jerk was more active than the right; there was a double sign of Babinski and normal eye grounds. An operation was decided upon. On opening the dura a mass of vessels protruded, and was so placed that the underlying cortex could not be seen. A month later an attempt was made to remove this angiomatous mass, but the patient did not survive the operation. The autopsy showed that the disease was confined to the cortex. Case 2: A boy, aged 10 years, who had his first convulsion when three months old. All convulsions began in the wrist of the left hand. In addition he had curious minor attacks, five or six times during the day, when he would seem sleepy, and have a numb feeling in his hand. There was weakness of the left seventh nerve and a pale telangiectasis over the forehead. The left eye-ground showed an old choroidal atrophy. An exploratory craniotomy was made, and an angiomatous mass was found in the dura having numerous connexions with the pial vessels. All vessels connecting the pia were tied, and the dural mass was tied above and below. Since the operation there had been only one violent and three slight attacks. The writer thought it essential to distinguish between a true or neoplastic angioma and the condition found in these two instances, which was congenital and not neoplastic.

(172) Lavage of the Spinal Canal in Cerebro-spinal Meningitis.

Aubertin and Chabanier (*Presse Médicale*, 1915) found that in the majority of their cases, and specially those brought to hospital in a state of coma, the fluid obtained on lumbar puncture was purulent. Hence, prior to the injection of antimeningococcic serum, which they regarded as the classical treatment, they decided to draw off more than the usual 40 or 50 c.cm. The difficulty was to withdraw a sufficiency of fluid without causing a too rapid decompression, but this they overcame by replacing the first fluid withdrawn by an equal quantity of artificial serum, and then repeating the "lavage" several times Although this both prolonged the operation and submitted the nerve centres to variations of tension, it apparently occasioned no inconvenience in the writers' series of 50 cases. Further, the "lavage" was painless, which, in their experience, was not the case when the specific serum was injected. Generally, when the patient was comatose three injections of 50 c.cm. of specific serum, preceded by "lavage," and practised on successive days, was followed by recovery. Having saved nearly all their patients by serum alone when the spinal fluid was clear, or by serum preceded by "lavage" when the fluid was purulent, the writers felt justified in regarding "lavage" as a useful adjuvant to serum therapy. It was a simple proceeding, required no special apparatus, and was painless and harmless.

(173) The Ocular Troubles of Neurasthenia.

T. A. Ross (*Edinburgh Med. Journ.*, 1915) is of opinion that neurasthenic asthenopia, characterized by discomfort or pain on using the eyes for near work, often followed by tinnitus, vertigo, nausea and other symptoms, does not depend on fatigue from over-use of the ciliary muscle, or from the state of the general health, but is a purely mental phenomenon. It is capable of cure by explanation to the patient of the mechanism which caused it. There are three causes: (1) It might be a reaction to emotion. Just as tears followed grief, so ocular discomfort might follow any depressing emotion. (2) It might originate from emotion and be sustained by expectation after the emotion had passed away. The patient might have been reading when the sensation was first noticed, hence an association would be formed, and though there might be no immediate history of depression, this would be obtained if the case were followed up. (3) It might be due to what Dejerine had termed dys-harmony. Automatic functions are badly performed if the will interfered with their performance. The neurasthenic not seeing well from inattention begins to peer, and this interferes with the normal automatism of accommodation. This caused discomfort and blurring of the type. The patient with astigmatism under 0.5 needs glasses, and only occasionally would glasses cure such a case. What did cure was the strong assurance, after careful examination, that the symptoms would disappear, coupled with an explanation of the way in which the phenomena arose.

(174) The Significance of Acro-ataxia and Proximo-ataxia.

C. F. Hoover (*Amer. Journ. Med. Science*, November, 1915) uses the term "acro-ataxia" to designate an impairment in the muscular sense of the intrinsic muscles of the hands and feet, and to distinguish this from ataxia of the proximal muscles of the extremities. Acro-ataxia without proximo-ataxia was seen only in the primary anæmias with nervous symptoms, and in peripheral neuritis, such as occurred in alcohol, lead poisoning, diabetes and diphtheria. Proximo-ataxia without acro-ataxia was seen only in disease of the spinal cord. This suggests that the nervous affection in primary anæmia begins in the peripheral nerves and ultimately involves the cord. In advanced stages of peripheral nerve and cord diseases both proximo-ataxia and acro-ataxia might be present.

(175) The Prognosis in Bullet Wounds of the Head.

Cadenat (*Paris Médical*, October, 1915) states that in no wounds should the prognosis be more guarded than in bullet wounds of the head. In cases of apparently slight scalp wounds, without functional disturbance, there was often splitting of the inner table, which brought on serious symptoms several days later. Hence immediate exploration was the indicated rule. But in some cases which had been successfully operated upon, the bone raised and the brain found normal and the patient relieved, either (1) *hernia cerebri*, reducible neither by compression nor lumbar puncture, had developed and proved fatal; or (2) weeks and even months later, Jacksonian epilepsy had arisen and progressed to coma, despite further operation; or (3) vertigo, paroxysmal headaches, visual trouble and intellectual torpor had remained. Cadenat's concluding dicta are: operate on all head wounds; be on guard against secondary infection and hernia; and always withhold prognosis!

(176) Tumour in Supramarginal Convolution.

Fearnsides (*Brain*, Vol. XXXVII., 1915) pointed out that while the general conclusion was that motor dyspraxia depended on a lesion of the left supramarginal convolution (cases reported by Kleist and others), or of the "left parietal region" (Liepmann), the majority of reported cases had presented both a complicated clinical picture and multiple lesions. Hence he published this case because the clinical interferences were restricted to motor dysphasia, dysgraphia, paraphasia and amnesic aphasia, and because a small, well-localized secondary carcinomatous nodule in the left supramarginal convolution was the sole lesion. The case was further remarkable in that such a lesion gave rise to the combination of motor dyspraxia and paraphasia. The motor dyspraxia was illustrated by unsuccessful efforts to thread a needle, to use scissors, to tie a knot and to light a pipe, and agreed with Wilson's definition, "the difficulty in performing certain subjectively purposive movements, or movement complexes, with conservation of motility, of sensation and of co-ordination"; while repeated mistakes in naming objects (he called a bunch of grapes, "rubber balls"), and a tendency to use wrong words in efforts at description, respectively, proclaimed his amnesic aphasia and paraphasia.

British Medical Association News.

SCIENTIFIC.

A meeting of the South Australian Branch was held at the House of the Branch, Hindmarsh Square, Adelaide, on October 26, 1916, Dr. J. C. Verco, the President, in the chair.

Dr. J. A. G. Hamilton read a paper on "Left-sided Pelvic Pain." We hope to publish this paper in a subsequent issue of the Journal.

Dr. W. Ray read a paper on Rectal Anæsthesia. It is proposed to publish this paper also at a later date.

Dr. R. H. Marten and Dr. H. Gilbert exhibited a specimen of a *tuberculous nodule in the tongue* of a man over 70 years of age. The lesion started as a painful fissue, and became indurated rapidly. It increased to the size of a large pea. Early malignant disease was diagnosed, and half of the tongue was removed. No other signs of tuberculosis were detected. On microscopical examination the section was found to contain areas of caseation and typical giant cell systems.

They also showed a *calcifying lipoma* removed from the abdominal wall of a man aged 74 years.

Dr. Helen Mayo exhibited a specimen of the abdominal organs of a child aged one month, who died of intestinal obstruction. The infant appeared to be healthy during the first two weeks after birth. Digestive troubles, associated with vomiting and discomfort, then manifested themselves. These symptoms continued for some ten days, and gradually became more severe. The condition then became acute. Considerable abdominal distension, vomiting and intestinal stasis were noted, and subsequently there was complete intestinal obstruction. A catheter was passed into the bladder without difficulty. After consultation, it was decided that an operation should not be performed, as the child's condition was hopeless. It died four days later. At the post-mortem examination it was found that death had been caused by intestinal obstruction due to pressure on the sigmoid flexure, and diagonally upwards on the hepatic flexure by the enormously distended and hypertrophied bladder. Both ureters were very large (as thick as the compressed sigmoid flexure), and both kidneys were hydronephrotic. A small *adenoma of the prostate gland*, about the size of a half pea, was found projecting into the urethra. This was judged to be the cause of the condition. The adenoma had probably begun during intrauterine life.

The following resolution was passed at the meeting:—

> In the opinion of this meeting, it is essential for the maintenance of the health of our troops in the trenches that ample reinforcements should be continuously sent to relieve them. Only by this means is it possible to prevent a wastage from disease even greater than that from wounds, and to avoid a serious reduction in the number and the strength of our men in the firing line.

A meeting of the Victorian Branch was held at the Medical Society Hall, East Melbourne, on November 1, 1916, Dr. A. V. M. Anderson, the President, in the chair.

Dr. H. Douglas Stephens presented two children, suffering from a disease which had been almost epidemic in Melbourne during the year, and of which he had seen cases in previous years. The speaker was unable to give an account of the ætiology of the condition, or to describe its nature. In some respects it seemed to bear some likeness to pellagra; his knowledge of that disease, however, had been limited to reading and conversation with other men, and he was therefore not prepared to make any definite statement in this connexion. Some of the cases bore a close resemblance to the affection known as cœliac disease. On this account he had been induced to treat the condition with pancreatic extract. He proposed to publish an account of the disease at a later date, and therefore contented himself with showing the cases that evening, and giving a brief account of its main characteristics.

The two patients shown came from widely separated parts of Victoria, although both were from country districts. Their age in each case was 13 months. Both children had been partially breast-fed, and both had been ailing for three months. The symptoms were wasting, sweating, and pinkness, with a form of subcuticular papulation of the hands and feet, which swelled at times. The rash occasionally caused itching. There was slight symmetrical enlargement of the inguinal, axiliary, and to a less extent, of the cervical and mastoid glands. The children were mentally irritable. There was an ulcerative condition of the mouth, involving the mucous membrane of the cheeks and gums, and in one case there was loss of some teeth. There was no vomiting, and with the exception of a tendency to constipation the motions were apparently normal. In one case there was a trace of albumin in the urine, and a slight reduction of Fehling's solution. No casts were present. There was a slight general leucocytosis. The Wassermann test applied to the serum was negative.

The puffiness and the pink colour of the skin of the hands and feet, and the papulation, the wasting, the extreme irritability, and the ulcerative stomatitis were the chief features of the condition in nearly all the children he had examined. The majority of his patients had been under 2½ years of age. He had only known of two fatal cases. None of his patients, however, had recovered in less than three months of the onset.

Public Health.

THE HEALTH OF NEW SOUTH WALES.

The following notifications have been received by the Department of Public Health, New South Wales, during the week ending October 28, 1916:—

	Metropolitan Combined District. Cs.	Dths.	Hunter River Combined District. Cs.	Dths.	Rest of State. Cs.	Dths.	Total. Cs.	Dths.
Enteric Fever	4	0	2	0	6	0	12	0
Scarlatina	59	0	9	0	16	0	84	0
Diphtheria	30	2	3	0	38	1	71	3
Cerebro-spinal Meningitis	6	2	0	0	4	2	10	4
Pulmonary Tuberculosis	39	12	0	0	†		39	12

† Notifiable only in the Metropolitan and Hunter River Districts.

The following notifications have been received by the Department of Public Health, New South Wales, during the week ending November 4, 1916:—

	Metropolitan Combined District. Cs.	Dths.	Hunter River Combined District. Cs.	Dths.	Rest of State. Cs.	Dths.	Total. Cs.	Dths.
Enteric Fever	8	0	2	0	11	1	21	1
Scarlatina	55	0	2	0	30	0	87	0
Diphtheria	32	3	2	0	38	0	72	3
C'bro-Sp'l Menin.	2	1	0	0	1	0	3	1
Pul. Tuberculosis	16	14	0	0	†		16	14
Malaria	1	0	0	0	0	0	1	0

† Notifiable only in the Metropolitan and Hunter River Districts.

THE HEALTH OF VICTORIA.

The following notifications have been received by the Department of Public Health, Victoria, during the week ending October 29, 1916:—

	Metropolitan. Cs.	Dths.	Rest of State. Cs.	Dths.	Total. Cs.	Dths.
Diphtheria	81	2	33	2	114	4
Scarlatina	14	0	9	0	23	0
Enteric Fever	1	0	2	1	3	1
Pulmonary Tuberculosis	30	7	12	4	42	11
Cerebro-spinal Meningitis	1	—	2	—	3	—

INFECTIVE DISEASES IN QUEENSLAND.

The following notifications have been received by the Department of Public Health, Queensland, during the week ending October 28, 1916:—

Disease.	No. of Cases.
Varicella	20
Diphtheria	22
Anterior-poliomyelitis	2
Cerebro-spinal Meningitis	1
Enteric Fever	15
Scarlatina	7
Pulmonary Tuberculosis	7

THE HEALTH OF SOUTH AUSTRALIA.

The following notifications have been received by the Central Board of Health, South Australia, during the week ending October 21, 1916:—

	Adelaide. Cs.	Adelaide. Dths.	Rest of State. Cs.	Rest of State. Dths.	Totals. Cs.	Totals. Dths.
Morbilli	23	0	96	0	119	0
Pertussis	7	0	70	0	77	0
Diphtheria	2	2	21	0	23	2
Pulmonary Tuberculosis	1	3	9	4	10	7
Enteric Fever	2	0	1	0	3	0
Puerperal Fever	0	0	2	0	2	0
Scarlatina	0	0	1	0	1	0
Erysipelas	0	0	1	0	1	0
Cerebro-spinal Meningitis	0	0	1	0	1	0

THE HEALTH OF TASMANIA.

The following notifications have been received by the Department of Public Health, Tasmania, during the week ending October 28, 1916:—

Disease.	Hobart. Cases.	Launceston. Cases.	Country. Cases.	Whole State. Cases.
Diphtheria	2	1	4	7
Pulmonary Tuberculosis	2	1	1	4
Scarlatina	0	0	2	2

INFECTIVE DISEASES.

The Bulletin of the Quarantine Service, issued on October 13, 1916, contains the following information:—

Variola.

During the period from September 29 to October 12, 1916, no further cases of small-pox have been reported in New South Wales.

Since the issue of the last bulletin 56 additional cases of variola, with 16 deaths, have been reported in the Dutch East Indies. A Bill of Health issued recently in Hong Kong gives information regarding five cases with four deaths. There was one case in the Straits Settlements during the week ending August 28, 1916.

Plague.

No reports have been received during the past fortnight from India, Ceylon, Mauritius, Hong Kong, or the Straits Settlements. There were two cases notified in Liverpool, England, on September 27, 1916, and three cases with one death in Java. The date of the Japanese report is not given.

Cholera.

In the Philippine Islands there were 380 cases between September 10 and October 7, 1916. In the same period there were 222 deaths. Since the issue of the last Bulletin information has been received from the Dutch East Indies to the effect that there have been 50 cases with 36 deaths. Cholera is reported to be present at Kobe, Nagasaki and Yokohama, in Japan.

Quarantine Officers.

The following is a list of Quarantine Officers and the date of gazettal of appointment in each case:—

Central Staff.

Dr. J. H. L. Cumpston, Director of Quarantine (12.7.1913).

Dr. W. J. Penfold, Chief Quarantine Officer, Laboratory Division (4.5.1916).

Mr. W. Trathen, Quarantine Officer (20.4.1912).

New South Wales.

Dr. C. W. Reid, Chief Quarantine Officer (General), N.S.W. (20.4.1912).

Dr. C. L. Park, Quarantine Officer, Sydney (12.12.1914).

Mr. P. E. Getting, Quarantine Officer, Sydney (17.8.1912).

Dr. J. MacMaster, Deputy Quarantine Officer, Sydney (25.2.1911).

Dr. R. U. Russell, Quarantine Officer, Newcastle (26.11.1910).

Dr. R. Dick, Deputy Quarantine Officer, Newcastle (21.9.1912).

Dr. J. Harris, Deputy Quarantine Officer, Newcastle (17.10.1914).

Victoria.

Dr. F. E. Cox, Chief Quarantine Officer (General), Victoria (31.8.1916).

Dr. H. Howard, Quarantine Officer, Melbourne (26.11.1910).

Dr. P. O. Lord, Quarantine Officer, Melbourne (8.5.1915).

Dr. T. J. M. Kennedy, Quarantine Officer, Geelong (26.11.1910).

Dr. J. Sleeman, Quarantine Officer, Portland (26.11.1910).

Dr. W. C. Marsden, Quarantine Officer, Port Fairy (12.10.1916).

North-Eastern Division (Queensland and Northern Territory).

Dr. J. S. C. Elkington, Chief Quarantine Officer (General), N.E. Division (13.7.1916).

Dr. G. E. Aitken, Acting Quarantine Officer, Brisbane (21.9.1916).

Dr. F. W. Page, Deputy Quarantine Officer, Brisbane (8.2.1913).

Dr. N. W. Markwell, Quarantine Officer, Thursday Island (17.7.1915).

Dr. H. Priestley, Quarantine Officer, Townsville (25.5.1916).

Dr. E. Humphrey, Deputy Quarantine Officer, Townsville (25.5.1916).

Dr. M. Gillies, Quarantine Officer, Bowen (26.11.1910).

*Dr. C. H. Cormac, Deputy Quarantine Officer, Bowen (24.6.1911).

Dr. A. Kortum, Quarantine Officer, Cooktown (26.11.1910).

Dr. P. J. Kerwin, Quarantine Officer, Cairns (24.6.1911).

Dr. V. Collins, Acting Quarantine Officer, Cairns (23.3.1916).

Dr. F. H. V. Voss, Quarantine Officer, Rockhampton (15.2.1913).

Dr. E. G. Thomson, Deputy Quarantine Officer, Rockhampton (6.6.1914).

Dr. C. W. M. Davidson, Deputy Quarantine Officer, Rockhampton (6.6.1914).

Dr. C. H. Clatworthy, Quarantine Officer, Gladstone (17.10.1914).

Dr. E. T. C. Schmidt, Quarantine Officer, Bundaberg (25.9.1915).

*Dr. T. O. Chenoweth, Quarantine Officer, Mackay (20.1.1916).

Dr. C. E. Williams, Acting Quarantine Officer, Mackay (22.6.1916).

Dr. A. A. McKay, Quarantine Officer, Maryborough (15.5.1916).

Dr. T. Wilson, Quarantine Officer, Darwin (13.7.1916).

South Australia.

Dr. F. S. Hone, Chief Quarantine Officer (General), South Australia (7.10.1915).

Dr. P. T. S. Cherry, Quarantine Officer, Port Adelaide 7.10.1915).

Dr. R. E. Magarey, Quarantine Officer, Port Adelaide (26.8.1911).

Dr. O. Leitch, Quarantine Officer, Port Pirie (30.9.1911).

Dr. W. H. Harbison, Quarantine Officer, Wallaroo (26.11.1910).

Dr. R. A. Goode, Quarantine Officer, Port Lincoln (1.5.1915).

*Dr. L. J. Meikle, Deputy Quarantine Officer, Port Lincoln (16.9.1911).

Mr. F. W. Allen, Quarantine Officer, Edithburg (26.11.1910).

Dr. F. J. Douglas, Quarantine Officer, Port Victor (10.2.1912).

Dr. L. J. Pellew, Quarantine Officer, Port Augusta (31.8.1916).

Western Australia.

Dr. D. G. Robertson, Chief Quarantine Officer (General), Western Australia (29.6.1916).
Dr. D. E. Williams, Quarantine Officer, Fremantle (26.11.1910).
*Dr. A. T. White, Quarantine Officer, Fremantle (24.6.1911).
Dr. J. Parer, Acting Quarantine Officer, Fremantle (5.6.1915).
Dr. G. H. S. Blackburne, Quarantine Officer, Albany 5.11.1910).
*Dr. A. S. Johnson, Deputy Quarantine Officer, Albany (1.5.1915).
Dr. A. R. Haynes, Quarantine Officer, Broome (31.8.1916).
Dr. J. I. Flynn, Quarantine Officer, Bunbury (26.11.1910).
Dr. Simon Joel, Deputy Quarantine Officer, Bunbury 26.11.1910).
Dr. J. Maunsell, Quarantine Officer, Cossack (26.11.1910).
Dr. T. J. Elliott, Quarantine Officer, Derby (31.8.1916).
Dr. L. M. Hungerford, Quarantine Officer, Geraldton (26.11.1910).
Dr. D. Browne, Quarantine Officer, Port Hedland (26.11.1910).
Dr. J. I. Stephen, Quarantine Officer, Wyndham (15.6.1912).
Dr. E. Paget Thurston, Quarantine Officer, Busselton (31.8.1916).
Dr. C. G. Thorp, Quarantine Officer, Onslow (31.8.1916).
Dr. A. J. J. Triado, Quarantine Officer, Carnarvon (11.11.1915).

Tasmania.

Dr. A. Clarke, Acting Chief Quarantine Officer (General), Tasmania (25.9.1915).
Dr. G. Sprott, Quarantine Officer, Hobart (26.11.1910).
*Dr. R. D. Campbell, Deputy Quarantine Officer, Hobart 26.11.1910).
Dr. G. H. Hogg, Quarantine Officer, Launceston (26.11.1910).
Dr. G. J. D. Davies, Quarantine Officer, Beauty Point 26.11.1910).

THE HEALTH OF BROKEN HILL.

The Medical Officer of Health of Broken Hill has issued his report for the quarter ending September 30, 1916. The population of the district is estimated at 2,800. During the quarter there were 226 births, 107 of males and 119 of females. The birth-rate, expressed as an annual rate, was 32.38% per 1,000 of population. The birth-rate for the corresponding quarter of 1915 was equivalent to 33.71.

The number of deaths registered was 106, and included 66 males and 40 females. The death-rate works out at an annual rate of 15.14. The figure for the corresponding quarter for 1915 was 12.53. There were 17 infants who died under the age of one year. The infantile death-rate was consequently 75.13 per 1,000 births. In the third quarter of 1915 it was 60. There were 16 deaths from pneumonia, 13 from cardiac disease, 10 from nephritis, 6 from diphtheria, 4 each from pulmonary tuberculosis, gastro-intestinal affections, cancer, cerebral affections and puerperal affections, and 3 from enteric fever.

During the quarter 133 cases of diphtheria had been notified to the Health Authority. This number is considerably in excess of that entered in the return for the corresponding quarter of 1913, 1914, and 1915. There were 14 cases of scarlatina, 8 cases of enteric fever, and 7 of cerebro-spinal meningitis. Both scarlatina and enteric fever were less prevalent than in the corresponding period of the previous year.

The Medical Officer ends his report as follows:—

> Urinary cesspits are still being added to the plague spot in the centre of the City near the Gaol. In my last report I again drew your attention to this matter; as usual you referred it to a sub-committee, and, as usual, no further consideration was given to the matter. You evidently intend to ignore the fact that your sanitary system is a large factor in the causation of disease in this community.

*On military service.

Vital Statistics.

SYDNEY AND NEWCASTLE.

The Government Statistician of New South Wales has published his reports on the vital statistics for Sydney and Newcastle for the month of September, and for the third quarter of the year, 1916.

The number of births registered during the month was 1,713. Of these 881 were of males and 832 of females. The birth-rate, which is equivalent to an annual birth-rate of 26.88 per 1,000 of population, is 5.3% below the average for the corresponding month in the previous five years. There were 121 illegitimate births, and consequently the illegitimate birth-rate was 1.92 per 1,000 of population. This figure is lower than the average for the preceding months of September.

The number of births registered during the quarter ending September 30, was 5,374, being 2,739 of males and 2,635 of females. The birth-rate is equivalent to an annual rate of 28.16 per 1,000 of population. The birth-rate for the third quarter was higher in 1911, 1912, 1913, and 1914, and lower in 1907, 1908, 1909, 1910, and 1915. The birth-rate for the quarter under review is just above that of the mean for the corresponding quarters in the 10 previous years. There were 336 illegitimate infants born during the quarter. This number is actually and relatively smaller than that of the corresponding quarter in the preceding 10 years. The illegitimate birth-rate, expressed as an annual rate, is 1.76.

During the month of September 1,727 deaths were registered in Sydney. The death-rate is equal to an annual death-rate of 11.4, which is somewhat higher than the average for the previous five years. There were 4 persons over 90 years of age who died during the month. The eldest was 94. Among the deaths there were 122 of infants under one year of age. The infantile death-rate works out at 71 per 1,000 births. This rate is higher than the average.

There were 2,216 deaths registered during the quarter. This is equivalent to an annual death-rate of 11.60. The rate was higher than the corresponding quarter in 1907, 1911, 1912, and 1915, and lower in 1908, 1909, 1910, 1913, and 1914. Of the 2,216 persons who died 356 were infants under one year of age. The infantile death-rate was consequently 66 per 1,000 births. This figure is just below the mean for the corresponding quarter in the preceding 10 years.

Among the principal causes of death the pathological conditions affecting the cardio-vascular system were the most numerous, both in the month and in the quarter. There were 128 deaths in the month, including 84 from organic diseases of the heart, 14 from cerebral hæmorrhage, 12 from diseases of the arteries, and 10 from acute endocarditis. During the quarter there were 439 deaths attributed to diseases of the cardio-vascular system. Of these, 252 were due to organic diseases of the heart, 81 to other diseases of the circulatory system, 65 to cerebral hæmorrhage, and 21 to endocarditis. The number of deaths from these causes is considerably higher than the average for the same period of the preceding five years. Of the acute infective processes, pneumonia caused 51 deaths during the month, and 130 during the quarter. Tuberculosis was responsible for 38 during the month, and 131 during the quarter, broncho-pneumonia for 24 during the month and 92 during the quarter, diarrhœa and enteritis for 22 during the month and 42 during the quarter, diphtheria for 22 during the month and 38 during the quarter, pertussis for 16 during the month and 29 during the quarter, acute articular rheumatism for 7 during the month, influenza for 6 during the month and 16 during the quarter, scarlatina for 5 during the month and 16 during the quarter, cerebro-spinal meningitis for 5 during the month and 25 during the quarter, enteric fever for 1 and 8, measles for 1 and 2, septicæmia for 1 and 5, and syphilis for 1 and 10 during the month and quarter respectively. There were 68 deaths from cancer during the month and 175 during the quarter, while nephritis killed 44 individuals in September and 144 in the quarter. Of the puerperal conditions, there were 5 deaths from illegal operations and 5 from puerperal septicæmia during the month out of 13 deaths entered under the cross-heading

"puerperal condition." During the quarter there were 41 deaths entered under this category.

The returns for the Newcastle district reveal that 93 males and 99 females were born in September. During the quarter 292 males and 303 females were born. The birth-rate for the month was equivalent to an annual rate of 39.24, and for the quarter to an annual rate of 40.52. Of the 191 infants born during September 4 were illegimate, while the total number of illegitimate births in the quarter was 26.

There were 66 deaths recorded in the month, and 231 in the quarter. The death-rate for the month was equivalent to an annual rate of 14.44, and the rate for the quarter is equivalent to an annual death-rate of 15.64. The death-rate for the month was considerably higher than the mean for September of the preceding 10 years. During the month there were 16 deaths of infants under one year of age, which is equal to an infantile mortality of 83 per 1,000 births. The number of infants who died during the quarter is not given.

The tables giving the causes of death are both for the month of September and for the third quarter of the year 1916. In the latter table the distribution of diseases is more reliable, on account of the larger numbers. There were 44 deaths from affections of the cardio-vascular system, including 21 from organic diseases of the heart, 8 from cerebral hæmorrhage and 5 from diseases of the arteries. Of the infective processes, pneumonia heads the list with 14 deaths, broncho-pneumonia comes second with 12, and acute bronchitis comes third with 10. There were 8 deaths from pertussis, 5 from tuberculosis, the same number from diphtheria, the same number from acute endocarditis, 3 from influenza, 2 each from septicæmia and acute nephritis, and 1 each from enteric fever and cerebro-spinal meningitis. Twelve deaths were due to cancer, and the same number to Bright's disease. There were two deaths from puerperal septicæmia.

Obituary.

THOMAS LAUDER BRUNTON.

The death of a famous physician and pharmacologist, Sir Thomas Lauder Brunton, Bart., M.D., D.Sc., LL.D., F.R.C.P., F.R.S., etc., at the age of 72 years, occurred in London in the third week of September. For some years past he had aged considerably, and, although he continued to work assiduously in his practice and in collecting his various contributions to the science of medicine, his many friends and colleagues had noted a failing of his activities for some little time. His fame was made at an early stage in his career, and his name remains a prominent one to-day among students of pharmacology.

Thomas Lauder Brunton was born in Roxburghshire, in Scotland, on March 14, 1844. His early eduoation was marked with singular distinction, and many honours fell to him. He studied medicine in Edinburgh, and graduated at the University at the age of 22. In 1867 he completed a famous research on the action of amyl nitrite in angina pectoris, and in the following year he obtained the gold medal for his thesis on the action of digitalis on the circulation and on the excretion of urine. At this time he worked in Leipzig under the direction of Carl Ludwig, and associated himself intimately with Hugo Kronecker, afterwards Professor of Physiology in Bern and Director of the Marey Institute in Paris. The influence of Ludwig appears to have been a great one, for his attention in the following years was directed more and more in chemical channels. He investigated the chemical nature of the nuclei of blood corpuscles while in Leipzig, and later, on his return to Great Britain, he turned his attention to the action of warmth in chloral poisoning. Through his researches, the physiology of the coronory arteries was advanced very considerably, and our present-day conceptions of pathological conditions of these vessels is based on his teaching. During the early 'seventies he entered upon an elaborate series of investigations on the action of various drugs, and many of his contributions form standard works on pharmacological action. For many years he continued to collect data, with the object of laying a solid foundation for a better understanding of the action of drugs in the treatment of disease. Perhaps the finest piece of work published by Brunton was that on "Chemical Constitution, Physiological Action and Antagonism," which was read before the Royal Society in 1884. In this work he analysed the general action of ammonia and its modification when combined with various radicals. Much of this work has received but scant notice, but it is of very high scientific value, and its value can be more fully appraised in the light of the recent developments of pharmacology. It would lead us too far were we to attempt to enumerate the individual researches which he undertook during the forty years following his graduation. Suffice it to say that they embraced a great variety of investigations into the action of medicaments, some enquiries into the physiology of the circulatory and respiratory systems, and not a few studies on digestion. During the time that he was occupied in advancing knowledge, he was engaged in teaching as physician at St. Bartholomew's Hospital, in London, and his great reputation throughout the whole world created for him a very large and important practice. His contributions to science were recognized widely. The Aberdeen and Edinburgh Universities gave him the honorary degrees of LL.D., the Royal University of Ireland presented him with the degree of doctor of medicine, and in 1906 the Royal Society appointed him a Vice-President. In 1900 he received the honour of knighthood, and in 1908 he was created a baronet. The American Academy of Arts and Sciences made him an honorary member, the Academy of Natural Sciences of Philadelphia made him a correspondent, the Imperial Military Academy of Medicine of Petrograd elected him an honorary member, and *la Société de Therapeutique de Paris* elected him a *correspondant étranger*.

Admiration and respect for his mental capabilities went hand-in-hand with affection and respect for the kindly, gentlemanly physican and courteous man. He never forgot an old student, and was always ready to show friendship and to help an earnest worker.

JOHN LANG NIVEN.

John Lang Niven, whose death was recorded in our issue of October 14, 1916, was born in Shanghai, of Irish parents, in the year 1876. At an early age he was brought back to the old country, and his general education was carried out at Watson's College, in Edinburgh. At the age of 17 he spent some time in Canada, and while there served in the mounted police. On his return to Scotland he entered upon his medical studies, and at the age of 28 left the Royal Infirmary, having secured the triple qualification of licentiate of the Royal College of Physicians of Edinburgh, licentiate of the Royal College of Surgeons of Edinburgh, and licentiate of the Faculty of Physicians and Surgeons of Glasgow. Both as a school boy and as a medical student he gained marked popularity among his compeers, and was much sought after for his excellence in all fields of sport. He was a fine cricketer, and played a first-class game of Rugby football. His keenness for games, however, did not divert his attention from the more serious things of life, and in these early years he laid a sound foundation, which stood him in good stead throughout his career as a medical practitioner.

After qualifying, he practised for a time in Hull and at a small seaside town in Yorkshire called Withernsea. He then obtained a Government appointment in the Federated Malay States. He held the positions of House Surgeon at the European Hospital at Kuala Lumpur, Medical Officer at the Kuala Lumpur Gaol, and Medical Officer at the General Hospital at Penang, and later became the Senior Medical Officer to the Sub-Government Servants in Kuala and Lumpur, Inspector at the Estates Hospital at Selangor, and Medical Officer of the Kuala Selangor Planters' Association. The unhealthy climate and the want of scope constrained him to seek a more congenial sphere of activity, more especially since the tropical conditions rendered it essential to send his daughter home during her early years, and the same influences began to tell on his wife's health. In 1912 he left Malay, and came to New South Wales. During the first eight or nine months he practised in Moree, but early in 1913 he changed the country for a suburb of Sydney, Artarmon. Here he built up a most promising practice within a short space of time, and

earned a well-deserved popularity among his patients and colleagues. But just as he was making his mark, war broke out, and early in 1915 he volunteered for military service with the Australian Army Medical Corps. He obtained his Captaincy in June, and accompanied the 1st Australian General Hospital to Egypt. Later, he saw active service in the Gallipoli Peninsula. At the second landing at Suvla Bay, on August 12, 1915, he was struck by a shell, and received severe injuries. The immediate effects of concussion passed off within a short time, but the damage inflicted on some of the internal organs gave rise to prolonged suffering. After a time he was transferred to the Wandsworth Hospital, in London. During his stay in hospital he had an attack of double pneumonia, from which he recovered partially. He was placed on a transport, and conveyed as a "cot case" back to Australia. On September 25, 1916, he succumbed to a long and most trying illness.

Dr. Niven possessed some of the most valuable characteristics of a true Irishman. His pluck was indomitable; his unselfishness was always expensive to himself, but an immense gain to his friends and his country; his geniality made him a general favourite, and his love of adventure imbued him with a wider view of life than is usual among men of our time. The country has lost heavily through his death, and the sympathy of his colleagues goes out to his widow and family in their heavy sorrow.

Books Received.

DISEASES OF CHILDREN, by A Dingwall-Fordyce, M.D., M.B., Ch.B., F.R.C.P.E.; 1916. London: A. & C. Black, Ltd. Crown 8vo., 482. Price, 10s. 6d.

BACK INJURIES AND THEIR SIGNIFICANCE UNDER THE WORKMEN'S COMPENSATION AND OTHER ACTS, by Archibald McKendrick, F.R.C.S.E., etc.; 1916, Edinburgh: E. & S. Livingstone. Crown, 8vo., pp. 173.

A TEXT-BOOK OF MEDICAL JURISPRUDENCE AND TOXICOLOGY, by John Glaister, M.D., D.P.H., F.R.S.E. Third Edition, 1915. Edinburgh: E. & S. Livingstone. Demi 8vo., pp. 857, with 137 illustrations.

TEXT-BOOK OF PUBLIC HEALTH, by E. W. Hope, M.D., D.Sc. Eighth Edition, revised and enlarged. Demi 8vo., pp. 267.

TEXT-BOOK OF FORENSIC MEDICINE AND TOXICOLOGY, by R. J. M. Buchanan, M.D., F.R.C.P., Lond., etc.; 1916. Edinburgh: E. & S. Livingstone. Demi 8vo., pp. 417

Medical Appointments.

Dr. H. R. Letcher, of Adelaide, has been appointed a Public Vaccinator.

Dr. John Hume has been appointed Medical Officer of Health, Greenbushes, Western Australia, in place of Dr. D. H. Nelson, resigned.

Medical Appointments.

IMPORTANT NOTICE.

Medical practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, 429 Strand, London, W.C.

Branch.	APPOINTMENTS.
VICTORIA. (Hon. Sec., Medical Society Hall, East Melbourne.)	Brunswick Medical Institute. Bendigo Medical Institute. Prahran United F.S. Dispensary. Australian Prudential Association Proprietary, Limited. National Provident Association. Life Insurance Company of Australia, Limited. Mutual National Provident Club.
SOUTH AUSTRALIA. (Hon. Sec., 3 North Terrace, Adelaide.)	The F.S. Medical Assoc., Incorp., Adelaide.
QUEENSLAND. (Hon. Sec., B.M.A. Building, Adelaide Street, Brisbane.)	Brisbane United F.S. Institute.
WESTERN AUSTRALIA. (Hon. Sec., 230 St. George's Terrace, Perth.)	Swan District Medical Officer. All Contract Practice Appointments in Western Australia.
NEW SOUTH WALES. (Hon. Sec., 30-34 Elizabeth Street, Sydney.)	Department of Public Instruction—Appointments as Salaried Medical Officers, with duties which include the treatment of school children. Australian Natives' Association. Balmain United F.S. Dispensary. Canterbury United F.S. Dispensary. Leichhardt and Petersham Dispensary. M.U. Oddfellows' Med. Inst., Elizabeth Street, Sydney. Marrickville United F.S. Dispensary. N.S.W. Ambulance Association and Transport Brigade. North Sydney United F.S. People's Prudential Benefit Society. Phœnix Mutual Provident Society. F.S. Lodges at Casino. F.S. Lodges at Lithgow. F.S. Lodges at Orange. F.S. Lodges at Parramatta, Penrith, Auburn, and Lidcombe. Newcastle Collieries — Killingworth, Seaham Nos. 1 and 2, West Wallsend.
NEW ZEALAND: WELLINGTON DIVISION. (Hon. Sec., Wellington.)	F.S. Lodges, Wellington, N.Z.

Diary for the Month.

Nov. 14.—N.S.W. Branch, B.M.A., Ethics Committee.
Nov. 15.—North Eastern Med. Assoc. (N.S.W.).
Nov. 15.—W. Aust. Branch, B.M.A., General.
Nov. 17.—Q. Branch, B.M.A., Council.
Nov. 21.—N.S.W. Branch, B.M.A., Executive and Finance Committee.
Nov. 24.—N.S.W. Branch, B.M.A., Branch (Ordinary).
Nov. 28.—N.S.W. Branch, B.M.A., Medical Politics Committee—Organization and Science Committee.
Nov. 29.—Vic. Branch, B.M.A., Council.
Nov. 30.—S. Aust. Branch, B.M.A., Branch.
Dec. 5.—N.S.W. Branch, B.M.A., Ethics Committee.
Dec. 6.—Vic. Branch, B.M.A., Annual Meeting.
Dec. 8.—Q. Branch, B.M.A., Annual Meeting.

EDITORIAL NOTICES.

Manuscripts forwarded to the office of this Journal cannot under any circumstances be returned.

Original articles forwarded for publication are understood to be offered to *The Medical Journal of Australia* alone, unless the contrary be stated.

All communications should be addressed to "The Editor," *The Medical Journal of Australia*, B.M.A. Building, 30-34 Elizabeth Street, Sydney, New South Wales.